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ABSTRACT

Professional requirements for physicians specializing in pediatrics were estimated to assist policymakers in developing guidelines for graduate medical education. In estimating service requirements for pediatrics, the pediatrics Delphi panel reviewed reference and incidence-prevalence and utilization data for 230 conditions that affect the ambulatory care practices of the general child health care provider. After adjusting incidence-prevalence rates, panelists reviewed data on the percentage of persons with each condition requiring health care. Leading ambulatory problems were identified, and delegated visits by condition were estimated. Based on the panelists estimates, a total of over 35,000 general pediatricians should be required in 1990 to perform patient care activities. Since some physicians would be primarily engaged in nonpatient care (e.g., teaching, research, and administration), a total of 38,978 pediatricians were estimated to be required in 1990. After factoring in an anticipated supply of nonphysician health care providers, the modeling panel estimated that between 29,000 and 31,500 general pediatricians would be required in 1990. Appendices include: lists of members of the Delphi panels, and estimated prevalence rates and physician shares, including recommendations on ambulatory care service needs for pediatrics. A bibliography is included. (SW)

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PHYSICIAN REQUIREMENTS-1990

For Pediatrics

OFFICE OF
GRADUATE MEDICAL EDUCATION

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U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources Administration

PHYSICIAN REQUIREMENTS-1990

For Pediatrics

Ramifications of the
Delphi Panel Deliberations

U.S. DEPARTMENT OF
HEALTH AND HUMAN SERVICES
Public Health Service
Health Resources Administration
Office of Graduate Medical Education

DHHS Publication No. (HRA) 81-639

FOREWORD

This document was developed by the Office of Graduate Medical Education (OGME) drawing upon the deliberations of the Graduate Medical Education National Advisory Committee (GMENAC) and the Child Medical Care Delphi Panel convened on its behalf. The purpose of the effort put forth by OGME is to assist policymakers in developing guidelines for graduate medical education based on physician manpower requirements for general pediatrics and its subspecialties.

This paper is one of a series of specialty-specific monographs developed by OGME. The document should serve as a valuable resource to governmental as well as private groups of people interested in estimating specialty-specific professional requirements.

GMENAC was chartered by the Secretary of Health, Education, and Welfare in 1976 to provide recommendations regarding changes in graduate medical education likely to achieve a balance in the specialty and geographic distribution of physicians, according to estimated needs of physician services. Estimates presented in this monograph were developed by OGME in support of the efforts of GMENAC to estimate requirements in 1990 for 23 medical specialties.

After completion of several sessions, estimates derived from the groups were reported to the Modeling Panel of GMENAC. The Modeling Panel examined the estimates made by the two panels and recommended to GMENAC that certain adjustments be made to the estimates. These recommendations, which have been endorsed by GMENAC, are also described in this report.

Jerald Katzoff, Chief of the Research and Analysis Branch of OGME, was responsible for planning, developing, and organizing the materials and methodology which served as a basis for the entire study.

Comments regarding this monograph may be sent to the Office of Graduate Medical Education at the Center Building, Room 10-30, 3700 East-West Highway, Hyattsville, MD, 20782.

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Several individuals have contributed significantly to the production of this monograph. Karen Rudzinski, M.A., Program Analyst, and Robert N. Thorner, Social Science Analyst, both of the Office of Graduate Medical Education (OGME), prepared this report, which was edited by Gail Issen, M.S.W. and Edna Simon. The expert panels of consultants put forth tremendous time and effort determining needs for general pediatrics and its subspecialties. In addition, materials provided by John P. Connelly, M.D., Director of the Division of Research and Health Services Development of the American Academy of Pediatrics, contributed to the implementation of the project.

The secretarial staff of OGME provided invaluable support services in producing a series of revised tables and written summaries throughout the project. Sherry Whipple, administrative assistant, OGME, was responsible for coordinating and arranging the series of Panel meetings which were held during the project term.

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I. INTRODUCTION

BACKGROUND

Over the past several decades, there has been a growing concern among the medical community, policymakers, and the public at large regarding the ability of the Nation to meet its health care needs. Initially, this took expression as a fear that a shortage would result from the combined effects of advancing medical knowledge, specialization, urbanization, and rising demand caused by greater public knowledge. To offset the perceived shortage, many government programs were instituted in the 1960s to increase the supply of physicians.

Gradually, however, there grew an awareness that the problem was not so much one of undersupply as it was one of maldistribution of physicians, both by geographic area and by specialty, and that the expanding supply of physicians would not solve the problems related to poor distribution. As concern about the physician maldistribution grew in the 1970s, many people in both government and the private sector debated the programs and policies that should be pursued in the future to assure that the health care needs of the public would be best served. This debate was of great concern when the Comprehensive Health Manpower Training Act of 1971 (P.L. 92-157) expired in 1974. Two years of continued national debate ensued, during which time several proposals were made to regulate the number and distribution of residency training programs and positions in an effort to correct the perceived physician specialty maldistribution. During those debates, the Secretary of the Department of Health, Education, and Welfare (DHEW) 1/ submitted a plan to establish an "Advisory Council on Graduate Medical Education," using existing authority under section 222 of the Public Health Service Act. The culmination of those debates was the Health Professions Educational Assistance Act of 1976 (P.L. 94-484).

GRADUATE MEDICAL EDUCATION NATIONAL ADVISORY COMMITTEE

The task of alleviating maldistribution thus fell to the Secretary of the U.S. Department of Health, Education, and Welfare who chartered the Graduate Medical Education National Advisory Committee (GMENAC) on April 20, 1976. The charter, which originally was to expire on April 20, 1978, was twice extended to April 30, 1980 and September 30, 1980. The Committee, as of September 1980, consisted of 19 representatives from the private sector (13 physicians, 2 nurses, 2 attorneys, 1 hospital administrator, and 1 economist) and 3 ex-officio Federal agency members.

1/ As a result of the creation of the Department of Education in May 1980, the Health and Welfare components of DHEW became the Department of Health and Human Services (DHHS).

As stated in the "Interim Report" (Department of Health, Education, and Welfare, 1979) the primary purpose of the Committee was to make recommendations to the Secretary regarding physician specialty and geographic distribution, and methods to finance graduate medical education. The Committee chose 1990 as its target year because by that date it was estimated that 30 percent of the current supply of physicians will have been replaced due to retirement, death or other causes, and 40 percent of the physicians in 1990 will have been trained since the inception of the Committee's work. Thus the opportunity existed to affect change by the Committee's efforts.

STRATEGIES FOR ANALYSIS

In its attempt to analyze problems related to the geographic and specialty maldistribution of physicians and the effect this has on planning for graduate medical education, GMENAC has concentrated efforts on the following areas:

1. The determination of "needs-based" requirements for each of the 23 medical specialties for 1990.

2. The determination of supply estimates for each of the 23 medical specialties in 1990.

3. The determination of branching and switching patterns in graduate medical education to estimate the number of residents completing a residency in each specialty by 1990.

4. The analysis of problems related to the geographic maldistribution of physicians.

5. The examination of the different methods of financing medical education, housestaff training and the delivery of services and the effect each has on specialty and geographic distribution.

6. The consideration of the implications that the utilization of nonphysician providers has upon the requirements of physicians.

7. The examination of the impact that the educational environment has upon the specialty and geographic choices of physicians.

A detailed discussion of the individual tasks of GMENAC are presented in the Report of the Graduate Medical Education National Advisory Committee to the Secretary, September 1980, Volumes Two thru Six. In Volume One of the Report, a summary of the major tasks of GMENAC is presented.

THE MODELING PROCESS

Generic Process

The generic model used in estimating professional requirements for each physician specialty is referred to as an "adjusted needs-based model" (see Figure 1). Existing epidemiological data and hospital utilization data are used as starting points in determining service requirements or needs. Data on those conditions, for example, that are known to be treated by physicians in a particular specialty, were selected based on an analysis of current practice content and estimates of the content of training in that specialty. These data were then adjusted by an expert panel to take account of poorly measurable variables such as the prevalence of self-limiting conditions, changing disease patterns and technology, and efficacy of preventive strategies.

Needs were generally estimated in terms of problem-specific annual visit rates utilizing the International Classification of Diseases, Adapted for Use in the United States (ICDA) schema. The ICDA is designed for the classification of morbidity and mortality information for statistical purposes, and for the indexing of hospital records by diseases and surgical procedures for data storage and retrieval. It was utilized as a baseline for estimating service requirements since many reference data bases utilize it.

The expert panel, provided advice at the points in Figure 1 shown as "P" using a modified Delphi process 1/ to reduce variance in responses. Each expert panel considered all the decision points for its specialty. The recommendations by the expert panels were then reviewed by the Modeling Panel of GMENAC and in public by GMENAC.

At P1 in Figure 1, data derived from various sources, in particular the Health Interview Survey (HIS), were examined. Deliberations at P1 were based upon intuitive judgments of "true need"; i.e., a list of diseases, diagnoses, preventive activities, hospital discharges, and counseling requirements with rates derived for each. Panelists were asked to adjust present prevalence and hospital discharge data for 1990 to account for unreported illnesses and changing disease trends.

Questions at P1

Questions addressed by the panel at P1 include the following:

1. Does the morbidity, as reported in the various data sources, adequately represent true incidence/prevalence and need?

1/ The Delphi process is described on pages 11 and 12 of this report.

2. Will the incidence/prevalence rates change by 1990?

At P2 of Figure 1, Delphi Panel members determined the amount of the "true need" which requires health intervention and in particular the expertise of the specialty in question.

Questions at P2

Questions addressed by the panel at P2 include the following:

1. What percentage of each morbidity should require health care intervention in 1990?

2. What percentage of each morbidity requiring health care intervention in 1990 should be seen by the specialty of interest either for diagnosis, consultation, referral and/or treatment?

The next step, denoted as P3 of Figure 1, was the determination of the norms of care for each disease or diagnostic category (ICDA code) for each specialty in ambulatory and hospital settings. The norms can be defined in terms of visit rates or units of time. It is difficult to account for minutes of "down time" while engaged in direct patient care. Therefore, annual per capita visit rates were used in the generic model for estimating norms of care. It should be noted that norms of care estimates were given in terms of average number of visits provided by particular specialists, realizing that they handle total care for some patients and partial care for others.

For ambulatory care requirements, available current "real world" data on actual utilization rates from various data sources such as Health Maintenance Organizations (HMOs), the National Ambulatory Medical Care Survey (NAMCS) and other sources were presented to panelists. In addition, normative visit data by such sources as Schonfeld were provided. Increases or decreases in such rates based on the panel's perception of what should constitute good medical care in 1990 were made.

In estimating norms of care data for hospital patients, panelists extrapolated from data provided on average lengths of stay to the average number of visits which should be provided per hospitalized day.

Questions at P3

The following questions were addressed at P3:

1. What are the average number of visits that should be provided by a particular specialist in an ambulatory setting in 1990?

2. Are average lengths of hospital stay for each diagnosis expected to change by 1990? If they are expected to change, adjust the present lengths of stay for future trends.

3. On the average, how many visits per day should a specialist provide to hospitalized patients?

After determining the average number of visits provided by a particular specialty, panelists at P4 recommended the percentage of total visits accruing to a specialist that should be delegated to trained nonphysician providers in 1990. This was then subtracted from total service requirements to yield the total number of service requirements accruing to a specific specialty.

Questions at P4

The following question was addressed at P4:

1. What percentage of norms of care for each diagnosis should be delegated in 1990?

After concurrence by the Modeling Panel of GMENAC and the entire Committee, the staff entered the decisions of the expert panels at P1, P2, P3, and P4 into the computer and determined the total service requirements for all or a proportion of all conditions falling within the practice purview of each specialty that treats each condition. The entire GMENAC then estimated the proportion of services that should fall to each specialty where there is overlap in content. For example, it was necessary to specify the proportion of diabetes that was treated by the family practitioner, internist, pediatrician and other specialists, or the proportion of surgery performed on intervertebral ("ruptured") discs by the orthopedic surgeon and the neurosurgeon. Existing data on the overlap of these distributions were analyzed and presented to GMENAC from sources such as the NAMCS, Hospital Discharge Survey (HDS), and the University of Southern California-Mendenhall Practice Profile Studies (USC study).

Computing the product of the adjusted needs and the service requirements for each condition and summing visits for all conditions, yields the total service requirements for each specialty.

At P5, issues related to hospital and ambulatory productivity as well as the impact that task delegability to nonphysician providers has on the productivity of a specialist were considered. Once task delegability was taken into consideration in the model, the total productivity of a particular specialist was estimated. Service requirements for a specialty were divided by the average yearly health care productivity of the specialist, in order to estimate full-time-equivalent (FTE) manpower requirements.

The final step in the generic model was the conversion of FTE physicians into headcount physicians by specialty (P6 of Figure 1). This was dependent on recommendations concerning the "down time," continuing medical education (CME) requirements, teaching, research, administration and other demands that consume time, thus reducing the maximum potential visit, operations, or other productivity measures. Background productivity estimates for most specialties were provided in the USC Study, the American Medical Association (AMA) profiles and specialty society data. Panel members were requested to modify these estimates as they deemed appropriate.

Issues at P5 and P6

Important productivity and task delegability issues pertinent to P5 and P6 included the following:

1. The number of weekly visits which should be made in the hospital and office by the specialist primarily involved in patient care in 1990.

2. The number of weekly hours devoted to patient care by the specialist primarily involved in patient care in 1990.

3. The percentage change in a specialist's weekly productivity, which should ensue as a result of utilizing nonphysician health care providers in 1990 (excluding the number of total visits which should be seen by nonphysician health care providers in 1990).

4. The percentage of specialists required for nonhealth care related activities (i.e., teaching, research, administration, etc.) in 1990.

5. The average number of weeks per year that should be spent in patient care by a specialist in 1990.

FIGURE 1: GENERIC ADJUSTED NEEDS-BASED MODEL USED BY SPECIALTY DELPHI PANELS TO ESTIMATE PROFESSIONAL REQUIREMENTS FOR 1990

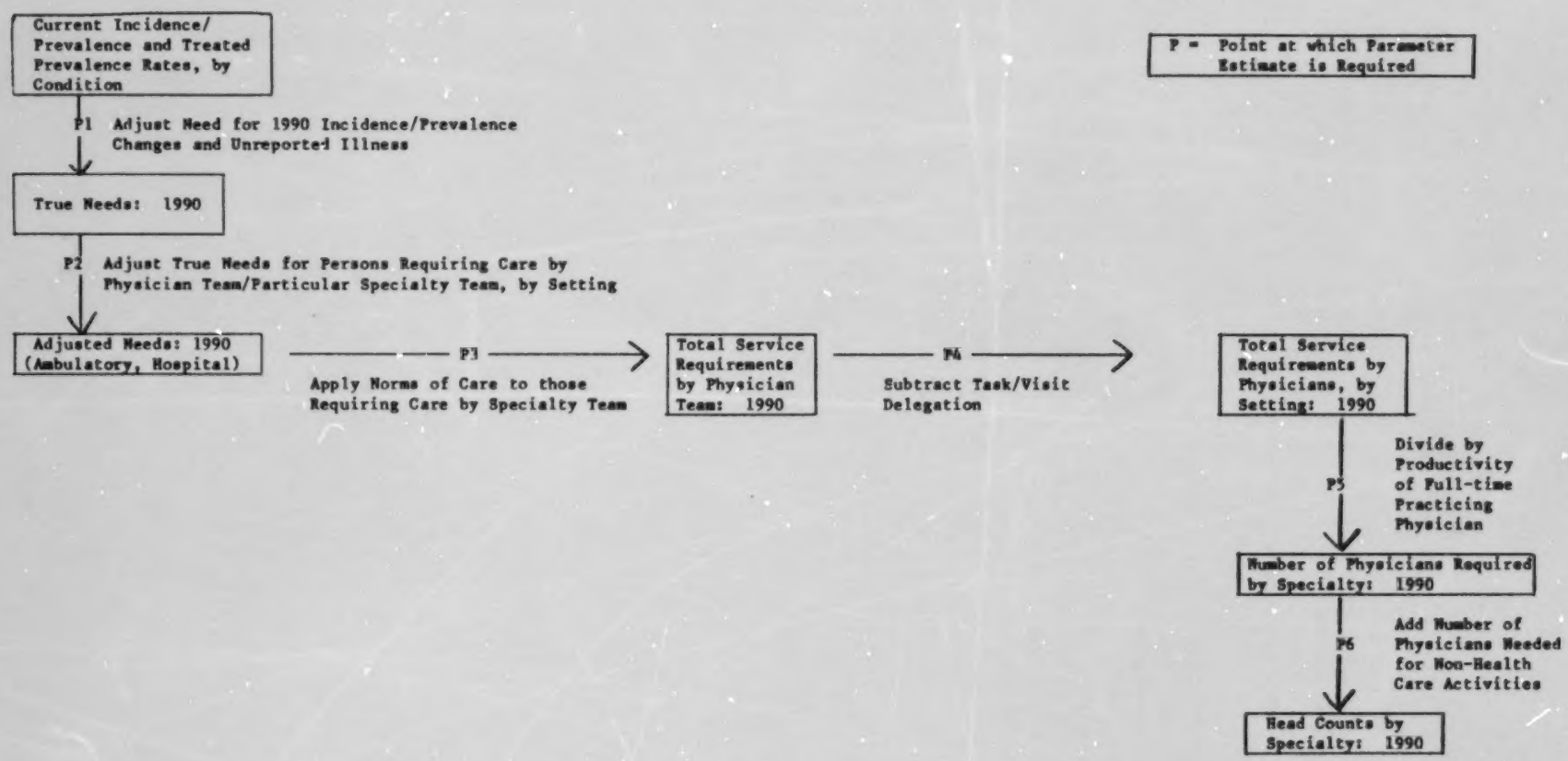
Current Incidence/ Prevalence and Treated Prevalence Rates, by Condition
P1 Adjust Need for 1990 Incidence/Prevalence Changes and Unreported Illness
True Needs: 1990
P2 Adjust True Needs for Persons Requiring Care by Physician Team/Particular Specialty Team, by Setting
Adjusted Needs: 1990 (Ambulatory, Hospital)
P3
Apply Norms of Care to those Requiring Care by Specialty Team
Total Service Requirements by Physician Team: 1990
P4
Subtract Task/Visit Delegation
Total Service Requirements by Physicians, by Setting: 1990
P5
Divide by Productivity of Full-time Practicing Physician
Number of Physicians Required by Specialty: 1990
P6
Add Number of Physicians Needed for Non-Health Care Activities
Head Counts by Specialty: 1990
P = Point at which Parameter Estimate is Required

Figure 1 (Continued)

P1 - True need was based on changes made to existing epidemiologic data.

P2 - Adjusted need was based on the percentage of true need requiring health care which should be handled by a particular specialty.

P3 - Norms of Care were described in terms of visits for each specialty.

P4 - Delegation was in terms of the percentage of visits to the specialty team which should accrue to nonphysician health care providers.

P5 - Productivity of specialists was in terms of number of visits provided within a week and hours spent in patient care. Productivity data on specialists were adjusted for changes ensuing as a result of utilization of services, other than direct visits, provided by nonphysician health care providers.

P6 - Calculation of manpower requirements was made by changing FTE requirements into total requirements based on the proportion of a specialist's workload devoted to nonhealth care activities (e.g. teaching, research, administration).

FIGURE 2: SAMPLE IMPLEMENTATION OF GENERIC ADJUSTED-NEEDS BASED MODEL

$$\text{Service Requirements for Physicians by Specialty} = \frac{\left[\text{Average 1990 Morbidity Requiring Care} \times \text{Norms of Care}\right] - \text{Total Number of Delegated Visits}}{\text{Annual Productivity of Physician}}$$

It should be noted that modifications of the above process may be made for specific specialties, due to the uniqueness of each. For example, some specialties, due to their small involvement in hospital care, have chosen to deal with hospital care in terms of a "top line" estimate on the proportion of their workloads which is comprised of hospital care and not by calculating specific estimates for service needs and norms of care for each relevant diagnostic condition.

In summation, total service requirements were calculated by multiplying the number of persons requiring physician care by the average norms of care per person. The next step converted total service requirements into FTE physicians, by specialty. This was performed by dividing service requirements by the expected productivity of each physician, expressed as visits, encounters or operations per year.

Sample implementation of the model outlined thus far is given in the equation in Figure 2. Included in the numerator of the diagram were only those visits which should accrue to a specialist in 1990. In addition, the denominator included changes in a specialist's productivity which result from task delegation, other than visits, to nonphysician health care providers. These FTE estimates were then converted into professional requirements by taking nonhealth care related activities of specialists into consideration.

Modification of Generic Model for Child Medical Care

The Child Medical Care Delphi Panel slightly modified the generic model since hospital care accounts for a relatively minor portion of the average practicing pediatricians practice (the 10 members of the Child Medical Care Delphi Panel estimated that in 1990 less than 20 percent of the practicing pediatrician's hours spent in direct patient care will be in the hospital). Therefore, the Panel chose not to utilize the generic model for hospital care requirements for pediatricians explicitly. Rather, the Panel implicitly accounted for hospital care in the ambulatory model used by them. Panelists divided the number of nonhospital visits per week that should be handled by the average practicing pediatrician, into the total number of ambulatory services required. This assumes that each average physician handles hospital visits in excess of his/her ambulatory productivity.

THE DELPHI PROCESS

Generic Description

To elicit the judgments of the expert panel and to obtain a consensus among its members, a modified version of the Delphi technique has been used. The Delphi process is a method that allows a group of individuals to formulate common judgments on complex issues. In this process, panel members exchange views and opinions anonymously through written material. Anonymity shields the panel's judgment from the influence of strongly articulated positions, aggressive personalities, and peer pressure. Because of the necessity for anonymity, the process is usually conducted by mail and may take up to six months to complete. In the GMENAC modeling effort, some of the deliberations of the panel took place orally, sacrificing anonymity for the sake of free, open, and immediate discussion.

The Delphi technique is usually divided into four phases. The first phase explores the subject being studied. Delphi participants are asked to express an anonymous judgment or opinion on a particular topic, either by questionnaire or in some written format. In responding, they become familiar with the task being undertaken and what is expected.

The second phase begins to identify areas of agreement and disagreement among the group. Questions may arise, for example, about the precise meaning of terms. Through feedback from the group, each participant begins to get some feeling for the reaction of the group as a whole and for how he or she compares with the group.

The third phase is aimed at narrowing the areas of disagreement through increased communication. Participants are given the group's responses and are asked to reconsider their original judgment if it differs from that of the group. If a participant decides not to change his or her opinion, the participant is encouraged to state briefly in writing the reason for disagreement with the group. These responses are fed back to the group for further consideration. This procedure is followed until consensus is reached or group variation is decreased, which usually occurs after three to five rounds. The last phase, which evaluates the process, takes place after all information has been analyzed and fed back to the group.

The actual operation of the Delphi technique is divided into a series of rounds, with a single round consisting of individual panelists expressing judgments and then receiving feedback on the judgments of the group as a whole. The design of a new round is usually not separate from the handling of the previous round. The form of the new round is determined by the presentation of results from the old round.

Modification of the Delphi Process for Child Medical Care

A modified Delphi technique was adopted by the Child Medical Care Delphi Panel to estimate service requirements for pediatricians in 1990. General child health care needs were developed during a series of three meeting sessions. At the first meeting, panelists were exposed to the generic adjusted needs-based model as well as background reference data on child health care needs and current utilization. Panelists, then, proceeded to orally review and adjust reference data for a few select conditions in order to gain practical experience in the research effort.

During the second session of meetings, panelists anonymously addressed each issue in the generic model for all child conditions in the ambulatory practice of physicians. Individual oral review of each item was undertaken and estimates were finalized. The last session of the meetings discussed special issues of concern in child medical care ranging from the role that family practitioners play in the provision of child care to the percentage of care that pediatricians should devote to adult medical care.

An additional meeting was held at which time specialists in the pediatric subspecialties of neonatology, hematology-oncology, nephrology, endocrinology, cardiology and allergy met to respectively estimate normative 1990 service requirements for their specialties. Subsequent to their delineation of service requirements for each subspecialty, representatives of the subspecialties met with adult medical care subspecialists in order to arrive at an agreement on subspecialty requirements for adult and child medical care.

II. GENERAL CHILD MEDICAL CARE MANPOWER REQUIREMENTS

Pediatrics is a medical specialty which primarily involves the patient care of children under the age of 17. A large portion of the care of children provided by general pediatricians focuses upon well care. The board-certified six pediatric subspecialties (neonatology, nephrology, allergy, cardiology, hematology/oncology and endocrinology) generally provide more specialized care than that rendered by general pediatricians.

In order to determine physician requirements for general pediatricians, a panel of 10 experts in child care met between June and October of 1979. Included in the panel were five pediatricians, two family practitioners, one physician in preventive medicine, a nurse practitioner and one physician's assistant. Pediatric subspecialty requirements were subsequently estimated for all board-certified subspecialties by one representative from each board-certified subspecialty. A list of Delphi Panel participants is presented in Appendix A.

RESULTS OF THE DELPHI PROCESS

Service Requirements

In estimating service requirements for general pediatricians, the Child Medical Care Delphi Panel reviewed reference incidence-prevalence and utilization data for 230 three-digit level conditions which affect the ambulatory care practices of the general child health care provider. A few of the three-digit level conditions were grouped by the Delphi Panel members before adjusting the reference data for 1990 projected changes. ICDA codes 380 to 384 (otitis media, otitis externa and other inflammatory diseases of the ear) were combined into one group; as were codes 483 to 486 (pneumonias and bronchopneumonias). Furthermore, the following additional groupings of conditions were constructed: ICDAs 490 to 491 (bronchitis); ICDAs 581 to 584, 590, 593 (nephritis, nephrosis and other diseases of urinary system); ICDAs 910 to 918, 920 to 929 (superficial injuries and contusions); ICDAs 966 to 989 (adverse effect of medicinal agents); ICDAs 540 to 543 (appendicitis); and ICDAs 712 to 717 (arthritis and rheumatism). A detailed listing of both the reference data and Delphi Panel responses to the reference data for each decision point are presented in Appendix B.

Panelists reviewed the reference data provided them and began their exercise by adjusting prevalence rates for 1990. For the large majority of conditions, panelists accepted the incidence-prevalence rates derived primarily from the Health Interview Survey (HIS) and the National Ambulatory Medical Care Survey (NAMCS). When morbidity rates from HIS were unavailable, the number of annual "first visits" to physicians' offices was taken from NAMCS and used as a proxy for morbidity. A few prevalence rates were adjusted upward from HIS reported prevalence rates, due to the panelists' perception that HIS data significantly undercounted these conditions. Other conditions such as venereal disease were adjusted upwards due to panelists perceptions that they would increase by 1990 due to life style changes. For example, venereal disease was increased five-fold partially due to present undercounting and partially to expected future growth. However, the venereal disease prevalence rate includes, not only children, but adults aged 18 thru 21. Among the

morbidities adjusted upwards were intestinal infectious diseases (including enteritis and diarrheal diseases); diseases of the respiratory system (including pharyngitis, tonsillitis, bronchitis and hay fever), mental disorders, and venereal diseases. Of these, venereal diseases had the smallest impact on requirements for child care, since the estimated corrected rate for this condition was substantially less than that for the others.

In contrast to the above, panelists adjusted prevalence rates downward for certain conditions which they thought would decline by 1990 due to increased health measures or changes in life-style. These adjustments are presented below in Table 1 in comparison with the upward adjustments discussed above.

The impact of the panelists upward adjustments in prevalence rates exceeded that of the downward adjustments. In particular, while panelists dramatically increased the present reported reference data for venereal diseases and mental disorders (due to significant underreporting found in the HIS); the major impact on service requirements stems from the increase of respiratory prevalence rates, which account for nearly 40 percent of the pre-delegation ambulatory service requirements for child care. Although present prevelance rates for many infectious diseases (e.g., rubella, chickenpox, mumps) were often halved by panelists, due to availability of vaccinations and better preventive capacities, their total impact on child care service requirements is slight, due to their originally low (comparative) reference rates.

After adjusting prevalence rates, panelists proceeded to review data on the percentage of persons with each condition requiring health care, and in particular the medical services of the general child care staff. Appropriate norms of care (in terms of average number of annual visits per condition) were assigned to those requiring care by a general child care physician. Table 2 displays the percentage distribution of various ICDA categories.

TABLE 1

MAJOR PREVALENCE RATE ADJUSTMENTS MADE BY
CHILD MEDICAL CARE DELPHI PANEL

Conditions	1977 Reference Rate	1990 Rate	1990 Pre-Delegation Impact of Condition on Service Requirements
Upward Adjustments			
098 Gonorrhea, and 090-099 Other venereal diseases	204	1,094*	0.5
290-315 Mental disorders	772	3,036	1.2
000-009 Intestinal infectious diseases	11,643	14,600	1.4
460-519 Diseases of the respiratory system	181,493	196,916	36.5
Subtotal	194,112	215,646	39.6
Downward Adjustments			
010-019 Tuberculosis	58	29	0.01
052 Chickenpox	4,720	2,430	0.20
055 Measles	855	428	0.07
056 Rubella	958	479	0.05
070 Infectious hepatitis	14	11	0.01
072 Mumps	685	343	0.02
390-392 Rheumatic fever	26	19	0.02
393-398 Rheumatic heart disease	58	46	0.02
Subtotal	7,374	3,785	0.56
TOTAL	201,486	219,431**	40.16

* This rate was provided for the population aged 0 thru 21, while all other prevalence rates were provided for children 0 thru 16 years of age. Consequently, part of the projected increase does not apply to children.

** This represents approximately a 9 percent increase over present prevalence rates for these select conditions.

TABLE 2

IMPACT OF ICDA GROUPINGS ON AMBULATORY SERVICE REQUIREMENTS
OF PEDIATRICIANS AND THEIR STAFFS
(Pre-Delegation)

Condition(s) Groupings	Percentage of Ambulatory Service Requirements
Infective and Parasitic Diseases	7.5
Neoplasms	0.1
Endocrine, Nutritional and Metabolic Diseases	0.6
Diseases of the Blood and Blood Forming Organs	0.8
Mental Disorders	1.3
Diseases of the Nervous System and Sense Organs	7.7
- diseases of the ear and mastoid process	(6.9)*
Diseases of the Circulatory System	0.3
Diseases of the Respiratory System	36.5
- common cold	(7.7)*
- acute bronchitis and bronchiolitis	(4.4)*
- influenza	(5.7)*
Diseases of the Digestive System	2.1
Diseases of the Genitourinary System	2.6
Diseases of the Skin and Subcutaneous Tissue	4.9
Diseases of the Musculoskeletal System and Connective Tissue	0.9
Congenital Anomolies	1.2
Certain Causes of Perinatal Morbidity and Mortality	0.3
Symptoms and Ill-Defined Conditions	4.2
Accidents, Poisonings and Violence	10.5
Special Conditions and Examinations Without Sickness	18.4
- well baby/child care	(17.6)*
TOTAL	100.0

* Numbers in parentheses refer to the percentage that each specific condition contributes to the entire service requirements.

The normative service requirements for children for 1990 are overwhelmingly dominated by non-severe conditions and prevention. Over 35 percent of children's needs are characterized by upper respiratory conditions, predominantly the common cold, bronchitis and influenza. An additional 17.6 percent of service requirements for children should focus on well care. Approximatley 80 percent of the general child care needs are accounted for by accidents, poisonings and violence, infective and parasitic diseases, diseases of the nervous system and sense organs (particularly conditions of the ear and mastoid process), upper respiratory conditions and well care.

The consensus of the Panel was that a child through the age of 16 should see a general pediatrician on an average of once a year for "well-child care," including the need for prophylactic innoculations and vaccinations. The Panel used as its benchmark the well-care protocols developed by the American Academy of Pediatrics (AAP) and Breslow-Somers. The AAP protocol results in a greater number of visits than that of Breslow-Somers--three visits every four years per child. The Panel felt that the Breslow-Somers protocols were too low since they are based on an "intact" family with two parents. It was felt that the needs for a high concentration of well-care visits in the first year of life will also increase the average to one well-care visit per year for each of the first 16 years of life.

Delegation

After estimating service requirements for children in 1990, panelists proceeded to focus on the issue of nonphysician delegation of visits in child health care. After much discussion, the Panel chose to endorse the medians of all member's responses concerning the percentage of "visit equivalents" which should be delegated in 1990. "Visit equivalents" are visits shared between the physician and nonphysician provider, and are not total visits which accrue solely to nonphysician providers. Panelists stipulated that the delegation estimates provided by them represent normative standards which assume that adequate supplies of nonphysician health care providers are available in 1990 to dispense health care under the supervision of physicians.

Across all morbidities and well-care visits, the Delphi Panel delegated 27 percent of all child health care visits. The percentage distribution of delegated visits across one digit ICDA groupings is displayed below in Table 3.

TABLE 3

PERCENTAGE OF AMBULATORY CHILD HEALTH CARE VISITS
DELEGATED BY THE DELPHI PANEL

Condition Groupings	Percentage of Total Visits Delegated per Condition Grouping	Percentage Distribution of All Delegated Visits
Infective and Parasitic Diseases	40.1	11.2
Neoplasms	0.0	0.0
Endocrine, Nutritional and Metabolic Diseases	36.5	0.9
Diseases of the Blood and Blood Forming Organs	8.4	0.3
Mental Disorders	22.6	1.0
Diseases of the Nervous System and Sense Organs	21.3	6.1
Diseases of the Circulatory System	8.3	0.1
Diseases of the Respiratory System	38.5	52.0
- common cold	(63.0)*	(17.8)*
Diseases of the Digestive System	13.1	1.1
Diseases of the Genitourinary System	13.5	1.3
Diseases of the Skin and Subcutaneous Tissue	26.7	4.8
Diseases of the Musculoskeletal System and Connective Tissue	9.1	0.3
Congenital Anomolies	7.6	0.3
Certain Causes of Perinatal Morbidity and Mortality	7.6	0.1
Symptoms and Ill-Defined Conditions	19.9	3.1
Accidents, Poisonings and Violence	8.6	3.4
Special Conditions and Examinations Without Sickness	20.1	13.0
- well baby/ child care	(20.0)*	(13.0)*
TOTAL	27.0	100.0
N	349,687,904	94,559,816

* The number in parentheses in the second column refers to the percentage that the specific condition contributes to the entire service requirements. The number in the first column refers to the percentage of visits delegated for the specific condition.

Delegation ranged from a low of 0 percent for neoplasms to a high of 40.0 percent for infectious and parasitic diseases. Of all specific conditions within ICDA groupings, the common cold had the largest percentage of visits delegated; 63 percent of all colds in children were deemed delegable.

Among the leading contributors to all delegated visits are diseases of the respiratory system (52.0%), special conditions and examinations without sickness (13.0%) and infective and parasitic diseases (11.2%). Particular conditions which account for a large percentage of the total delgated visits are the common cold (17.8%) and well baby/child care (13.0%). Thus, delegation for child health care was greatest among the least severe morbidities and well care.

Adjustments for Care Provided Persons Over Age 16

Reference data provided panelists as well as panelists' responses refer to the total child population in the United States ages 0-16. The Panel therefore chose to develop requirements for all ages by adding on to the estimates derived for the population ages 0-16 the percentage of the pediatrician's practice in 1990 that should be devoted to patients 17 years of age and older. The Panel's median response was 7 percent, which represents a 30 percent increase over the current 5.4 percent of a pediatrician's patients above the age of 16, as reported by the USC Mendenhall study. It was felt that in 1990 the pediatrician will have a greater role in adolescent medicine and that this will account for the predicted increase.

Correction for Care Provided Children by Pediatricians

Estimates derived by panelists for children 0-16 years of age did not differentiate between care provided by the general pediatrician and other physicians normally engaged in general child care activities. In effect, combined requirements for child care were derived for all general child care physicians. After much deliberation concerning the appropriate methodology to be utilized in portioning child medical care requirements between the general pediatrician and other general child providers, the Panel chose not to differentiate between the two based on training criteria or by morbidity condition, since the Panel felt that this would prove to be an impossible undertaking. Rather, the Panel chose to adopt "a supply-driven" model in which the current proportions of the general pediatricians' practice, as well as other general child care providers' practice devoted to child care, are meshed to become the "time equivalent" child medical care practitioners. For example, using the current supply of pediatricians and General Practitioners/Family Practitioners (GP/FPs), the percent of all child care accruing to the GP/FP aggregate specialty is 32 percent. This percentage declines to 25 percent if the 1990 projection supplies of general pediatricians and GP/FPs as developed from the SOAR (see Supply of Health Manpower, 1970, Profiles and Projections to 1990, 1974) model are utilized. The Panel chose to accept the application of this "supply-driven" methodology utilizing 1990 projections from the supply model to be adopted by GMENAC

that was not as yet available for the Panel's deliberations*. It was the Panel's understanding, however, that the recent growth in family practitioner training programs will moderate by 1990.

Ambulatory Productivity and Physician Headcounts

In order to convert service requirements into professional headcounts, the total number of visits required for children must be divided by the annual average number of ambulatory visits handled by a general pediatrician primarily engaged in patient care. By 1990, the panel estimated that the average practicing pediatrician will handle 127.5 visits per week, which is slightly higher than the 1976 ambulatory number reported by the AMA. In 1976, the AMA estimated that 122.7 visits on average per week were performed by practicing pediatricians on an ambulatory basis. The Delphi Panel figure accounts for future increases in organizational efficiency - approximately nearly five percent of current productivity - which will ensue from greater task delegation.

Panelists further estimated that in 1990, the average practicing pediatrician primarily engaged in patient care will work 46 weeks per year. This represents a decrease from the AMA 1976 reported estimate of 47.3 weeks. In the future, panelists expected a decrease in weeks worked per year based on increasing trends toward more leisurely life-styles and tendencies toward group practices.

Stemming from the panelists estimates, as evidenced in Table 4, a total of over 35,000 general pediatricians should be required in 1990 to perform patient care activities. Since the panel further estimated that 10 percent of all general pediatricians in 1990 should be primarily engaged in such nonpatient care activities as teaching, research and administration, a total of 38,978 general pediatricians were estimated to be required in 1990.

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* It should be noted that the supply projections emanating from the SOAR model were not endorsed by GMENAC. The Office of Graduate Medical Education has developed its own supply projections model (see Integrated Physician Supply Model for Estimating Supply in 1990, 1980) utilizing different assumptions from that of SOAR.

TABLE 4

PEDIATRIC MANPOWER REQUIREMENTS DERIVED FROM DELPHI PANEL RESPONSES

		Before Delegation	After Delegation
1.	Number of Child Morbidity Visits	285,476,485	203,798,714
2.	Number of Child Well-Care Visits[1]	64,211,419	51,329,374
3.	Sum of Child Visits	349,687,904	255,128,088
4.	Number of Nonhospital Visits per Pediatrician per Year	5,584	5,865 [2]
5.	Number of General Pediatricians and Other Physicians Required for Child Medical Care Activities	62,623	43,500
6.	Number of Child Patient-Care General Pediatricians Required[3]	46,967	32,625
7.	Number of Patient-Care General Pediatricians Required[4]	50,502	35,081
8.	Number of Total Active General Pediatricians Required[5]	56,113	38,978

1/ Included in the well care are special conditions and examinations without sickness.

2/ Adjusted to account for Panel's estimate of 5 percent potential for increased task delegability in 1990.

3/ Previous estimates reduced by 25 percent to account for child-care requirements accruing to GP/FP in 1990.

4/ Accounts for Panel's estimate of 7 percent of pediatrician's patient care practice in 1990 for patients 17 years of age and older.

5/ Accounts for Panel's estimate of 10 percent of pediatricians who should be engaged in nonpatient care activities.

NOTE: These requirements do not take account of the impact of other physician specialties as well as Modeling Panel revisions.

MODELING PANEL REVISIONS

On March 1, 1980 the Modeling Panel reviewed the responses of the Child Medical Care Delphi Panel. It recommended eight changes to the following diseases and disease groups:

1. ICDA Group: ICDAs 380, otitis externa; ICDA 381, otitis media without mention of mastoiditis; and ICDA 384, other inflammatory diseases of ear -- decreased percent requiring health care that should be seen by general health care physicians in 1990 from 100 percent to 95 percent.

2. ICDA Group: ICDA 623, uterovaginal prolapse; ICDA 626, disorders of menstruation; and ICDA 629, other diseases of female genital organs -- decreased percent requiring health care that should be seen by general health care physicians in 1990 from 100 percent to 80 percent.

3. ICDA Disease 692, other eczema and related conditions -- decreased 1990 norms of care from 3.5 visits to 2.5 visits.

4. ICDA Disease 706, diseases of sebaceous glands -- decreased 1990 norms of care from 4.0 visits to 2.0 visits.

5. ICDA Disease 746, congenital anomalies of heart -- decreased 1990 norms of care from 6.0 visits to 3.0 visits.

6. ICDA Disease 873, other and unspecified laceration of head -- decreased percentage requiring health care that should be seen by general health care physicians in 1990 from 90 percent to 70 percent.

7. ICDA Group: ICDA 910, superficial injury of face, neck, and scalp, and other (911-918) -- decreased percent requiring health care from 80 percent to 75 percent.

8. ICDA Group: ICDAs 965-989, adverse effect of medicinal agents and toxic effect of substances chiefly nonmedicinal as to source -- decreased 1990 norms of care from 2.5 visits to 2.0 visits.

As a result of these Modeling Panel revisions, the distribution of condition groupings as seen below in Table 5 - does not substantially differ from the Delphi Panel data. A slight reduction of approximately three percent in the total number of visits is observed. However, dominating the services of children are the same major groups of conditions such as diseases of the respiratory system and special conditions and examinations without sickness. Together, these groupings comprised nearly 55 percent of the Delphi Panel service requirements and nearly 58 percent of the Modeling Panel's service requirements.

TABLE 5

IMPACT OF MAJOR ICDA GROUPINGS ON CHILD CARE SERVICE REQUIREMENTS STEMMING FROM GMENAC REVISIONS TO DELPHI PANEL DATA
(Pre-Delegation)

ICDA Groupings	Percentage of Service Requirements	
	Delphi Panel	GMENAC
Infective and Parasitic Diseases	7.5	7.7
Neoplasms	0.1	0.2
Endocrine, Nutritional and Metabolic Diseases	0.6	0.7
Diseases of the Blood and Blood Forming Organs	0.8	0.9
Mental Disorders	1.3	1.3
Diseases of the Nervous System and Sense Organs	7.7	7.6
-diseases of the ear and mastoid process	(6.9)*	(6.2)*
Diseases of the Circulatory System	0.3	0.3
Diseases of the Respiratory System	36.5	37.6
-common cold	(7.7)*	(7.9)*
-acute bronchitis and bronchiolitis	(4.4)*	(4.6)*
-influenza	(5.7)*	(5.9)*
Diseases of the Digestive System	2.1	2.2
Diseases of the Genitourinary System	2.6	2.5
Diseases of the Skin and Subcutaneous Tissue	0.9	0.9
Diseases of the Musculoskeletal System and Connective Tissue	4.9	3.8
Congenital Anomolies	1.2	0.9
Certain Causes of Perinatal Morbidity and Mortality	0.3	0.3
Symptoms and Ill-Defined Conditions	4.2	4.3
Accidents, Poisonings and Violence	10.5	10.5
Special Conditions and Examinations Without Sickness	18.4	18.9
-well baby/child care	(17.6)*	(18.1)*
TOTAL	100.0	100.0
N** =	349,687,904	339,975,877

* The number in parentheses refers to the percentage that specific conditions contribute to all service requirements.

** This is the N of ambulatory care visits prior to correction for visit delegation and simultaneity occurrence of co-existing conditions.

The Modeling Panel also made the following revisions which impact on the total service requirements for children:

-- Since the Child Care Panel developed morbidity condition-specific visits without accounting for the possibility of multiple conditions that could be handled by the general child care provider in any one visit, the Modeling Panel recommended a 25 percent reduction in the number of visits accruing to the child care specialty. This estimate was based on data derived from the National Ambulatory Medical Care Survey which indicated that the average general pediatrician currently handles 1.317 conditions per visit.

-- In its calculations the Modeling Panel assumed that by 1990, 15 percent of the GP/FP requirements profile will be in child medical care. This figure was estimated by the Adult Care Panel which developed service requirements for the specialties of general/family practice and general internal medicine. The Adult Care Panel had estimated that 5 percent of the practice of general internal medicine should be in child medical care. The Modeling Panel felt that by 1990 this estimate should be reduced to 3 percent based on appropriate utilization of skills.

-- Based on the anticipated supply of nonphysician health care providers available in 1990 for child medical care, the Modeling Panel estimated that only 15 percent of all ambulatory pediatric visits could be handled by the nonphysician health care provider supply. Previously, the Delphi Panel recommended that 27 percent of ambulatory visits should be delegated.

-- Emergency physicians working in emergency rooms provide a substantial amount of general medical care. Approximately 6 million annual visits were subtracted from the general pediatricians' workload to account for this impact. The calculation of this total was based on total projected visits to emergency rooms, in particular for accidents, poisonings, and violence.

   The USC-Mendenhall data were used to estimate the proportion of patients in each class that were aged 16 or younger. Then, (1) the excess of emergency room visits for accidents, poisonings, and violence over total child care first visits for these conditions which the child care panelists had said would be handled by physicians other than general pediatricians was subtracted from the general pediatricians workload; and (2) all emergency room visits for "other conditions" were subtracted from the general child care providers' workload. The total of these items was, as noted, about 6 million annual visits.

As a result of these revisions seen in Table 5, a total of 28,712 general pediatricians should be required in 1990. After considerable deliberations the Modeling Panel finally recommended a range of between 29,000 and 31,500 general pediatricians for 1990. The GMENAC committee adopted this recommendation. The median of the range is approximately 78

TABLE 6

SUMMARY OUPUT OF THE CHILD MEDICAL CARE DELPHI PROCESS AND MODELING PANEL REVISIONS

(Post-Delegation)

		Delphi Panel	Modeling Revisions
1.	Number of Child Morbidity Visits	203,798,714	237,650,121
2.	Number of Child Well-Care Visits[1]	51,329,374	51,329,374
3.	Sum of Child Visits	255,128,088	288,979,495 [2]
4.	Sum of Child Visits		219,422,547 [3]
5.	Number of Nonhospital Visits per Child Medical Care Practitioner per Year[4]	5,865	5,865
6.	Number of Physicians Required for General Child Medical Care Activities	43,500	37,412
7.	Number of General Pediatricians Required for Child Care	32,625 [5a]	23,943 [5b]
8.	Number of Patient-Care General Pediatricians Required[6]	35,081	25,843
9.	Number of Total Active General Pediatricians Required[7]	38,978	28,712

1/ Included in the well care are special conditions and examinations without sickness.

2/ The Modeling Panel estimated that 15 percent of all pediatric visits could be handled by nonphysician health care providers in 1990. However, this estimate assumes that 20 percent of the well-care visits should be delegated.

3/ Adjusted by Modeling Panel to account for a simultaneity factor of 1.317 conditions per visit.

4/ Adjusted to account for the Child Medical Care Panel's estimate of 5 percent potential for increased task delegability in 1990.

5a/ Previous estimates reduced by 25 percent to account for child-care requirements accruing to GP/FP in 1990.

5b/ 37,412 general pediatricians has been reduced by 11,113 full-time equivalent (FTE) GP/FPs engaged in child patient care activities in 1990. Based on Modeling Panel's recommendation that 15 percent of projected requirements of FTE patient care GP/FPs to be engaged in child medical care. In addition, the Modeling Panel reduced the estimate by 2,356 pediatricians due to the manpower impact of internal medicine (equivalent to 1,396 pediatricians) and the emergency medicine specialty (equivalent to 960 pediatricians) on child care.

6/ Adjusted to account for Child Medical Care Panel's estimate of 7 percent of general pediatrician's practice in 1990 for patients 17 years of age and older (not adjusted for impact of internal medicine).

7/ Adjusted to account for Child Medical Care Panel's estimate of 10 percent of general pediatricians who should be engaged in nonpatient care activities in 1990.

percent of the requirements recommended by the Delphi Panel. Part of the difference between the two estimates stems from the fact that the Modeling Panel figure takes into consideration additional care provided to children by emergency medicine and internal medicine physicians and also adjusts for simultaneity in care across multiple conditions.

COMPARISON OF CURRENT AND 1990 PRACTICE PROFILES OF GENERAL PEDIATRICIANS

Comparisons of the current and projected 1990 practice profiles of general pediatricians are presented in Tables 7 and 8. In Table 7, the percentage distribution of the 10 leading conditions projected for 1990 are compared with their distribution in the 1978 practice profiles of pediatricians taken from the USC practice profile study. Overall, the 10 leading conditions projected for 1990 account for slightly over one-half of the pediatrician's profile. This is approximately the same distribution found in the 1978 USC study. Condition specific differences, however, are found. For example, in the current practice profiles of pediatricians, well care accounts for 25 percent of the practice of pediatricians, while in the GMENAC study, it was projected to account for only 17.8 percent. This difference may be attributable to substantial visit delegation recommended for well care by GMENAC. Acute nasopharyngitis is observed to be expected to constitute a larger proportion of the pediatrician's practice in 1990 (4.1%) than it currently does (0.8%) as are influenza and bronchitis, which currently comprise 1.5 percent of the pediatrician's practice and in 1990 are expected to constitute 11.0 percent of the practice. In contrast, otitis media without mastoiditis currently comprises approximately twice the amount of visits (10.8%) than GMENAC recommends it should in 1990 (4.8%). Acute pharyngitis also currently accounts for over twice the percentage of the pediatrician's practice (5.8%) than deemed should be in 1990 by GMENAC (2.3%).

In Table 8, the 10 current leading conditions are compared with the GMENAC projections. Overall, these 10 conditions comprise 62.7 percent of the pediatricians' practice, but in 1990 are expected to account for only 33.6 percent of the practice. In both studies well care is the leading ranking condition in the practice of pediatricians. Larger differentials are found in particular for pneumonia, acute pharyngitis, acute URI-multiple unspecified sites, diarrheal disease and otitis media without mastoiditis. One partial explanation for the discrepencies may stem from diagnostic classification discrepencies between the two studies, especially regarding the classification of upper respiratory conditions.

TABLE 7

COMPARISON OF DISTRIBUTIONS OF TEN LEADING PEDIATRIC PROBLEMS FROM PROJECTED 1990 GMENAC PROFILE WITH 1978 PROFILE DERIVED FROM USC PEDIATRIC STUDY
(Post-Delegation)

		ICDA and Diagnosis (Rank Order)	Percentage of Child Visits: 1990 GMENAC	Percentage of Child Visits: 1978 Pediatric Study 1/
1	YOO	Medical or special examination 2/	17.8	25.5
2	470	Influenza, unqualified	6.2	0.7
3	466	Acute bronchitis/bronchiolitis	4.8	0.8
4	381	Otitis media w/o mastoiditis 3/	4.8	10.8
5	460	Acute nasopharyngitis	4.1	0.8
6	873	Other and unspecified lacerations of head	2.9	0.4
7	493	Asthma	2.9	1.4
8	491	Chronic bronchitis 4/	2.5	2.8
9	462	Acute pharyngitis	2.3	5.8
10	079	Other viral diseases	2.2	1.2
		TOTAL	50.5	50.2

1/ Source: University of Southern California. Pediatrics Practice Study Report, July 1979. This distribution does not focus on all conditions due to non-specification of certain conditions. It is assumed that the non-specified conditions are distributed in like manner as are the specified ones.

2/ For GMENAC, ICDA YOO refers specifically to well baby and child care, as well as special examinations and conditions.

3/ GMENAC combined ICDAs 380, 381 and 384. The percentage of visits was adjusted to account for the contribution of ICDA 381.

4/ GMENAC combined ICDAs 490 and 491. The percentage of visits was adjusted to account for the contribution of ICDA 491.

TABLE 8

COMPARISON OF DISTRIBUTIONS OF TEN LEADING PEDIATRIC PROBLEMS FROM 1978 USC PEDIATRIC STUDY WITH PROJECTED 1990 GMENAC PROFILE (Post-Delegation)

ICDA and Diagnosis (Rank Order)			Percentage of Child Visits	
			1978 USC Pediatric Study	1990 GMENAC
1	YOO	Medical or special examination 2/	25.5	17.8
2	381	Otitis media w/o mastoiditis 3/	10.8	4.8
3	486	Pneumonia, unspecified 4/	6.1	1.3
4	462	Acute pharyngitis	5.8	2.3
5	465	Acute URI - multiple/unspec. sites	4.3	0.4
6	009	Diarrheal disease	3.0	0.4
7	491	Chronic bronchitis 5/	2.8	2.5
8	463	Acute tonsillitis	2.8	1.7
9	692	Other eczema and dermatitis	1.6	1.8
10	464	Acute laryngitis and tracheitis	1.6	0.6
		TOTAL	62.7	33.6

1/ Source: University of Southern California. Pediatrics Practice Study Report, July 1979. This distribution does not focus on all conditions due to non-specification of certain conditions. It is assumed that the non-specified conditions are distributed in like manner as are the specified ones.

2/ For GMENAC, ICDA YOO refers to all well baby and child care, as well as special examinations and conditions.

3/ GMENAC combined ICDAs 380, 381 and 384. The percentage of visits was adjusted to account for the contribution of ICDA 381.

4/ For GMENAC this group includes all pneumonia; ICDAs 483, 485 and 486. The percentage of visits was adjusted to account for the contribution of ICDA 486.

5/ GMENAC combined ICDAs 490 and 491. The percentage of visits was adjusted to account for the contribution of ICDA 491.

III. MANPOWER REQUIREMENTS FOR THE PEDIATRIC SUBSPECIALTIES

OVERVIEW

In November 1979, one consultant from each of the six pediatric subspecialties, represented by subspecialty boards, met to provide input to the generic model used to derive pediatric subspecialty manpower requirements. Pediatric allergy, pediatric cardiology, pediatric hematology-oncology, pediatric nephrology, pediatric endocrinology, and neonatal-perinatal medicine were represented. The list of persons involved in these meetings is contained in Appendix A.

Each individual subspecialist decided if both ambulatory and hospital data should be utilized to estimate requirements, or if requirements should be based upon one or the other. If a subspecialist chose to examine hospital and ambulatory data to derive requirements, the ambulatory and hospital visits were added together and divided by the total patient care productivity. Pediatric allergy and endocrinology were seen as primarily ambulatory based and therefore the panelists for these subspecialties considered only ambulatory data. The other subspecialties examined both hospital and ambulatory data.

For neonatology, since all care administered is in the hospital and since there are generally few patients older than one year, the subspecialist representing this area presented an alternate methodology (see neonatology section for details) to those offered by GMENAC to determine manpower requirements.

Ambulatory Care Requirements

In modeling the pediatric subspecialty requirements, most of the subspecialties were considered to be primarily referral-based. The subspecialists were presented with reference material compiled from the Delphied responses of the Child Medical Care Delphi Panel as well as material from the multiple data sources presented in the briefing book. Using this material as a starting point for their deliberations, the subspecialists considered those ICDAs that the Child Medical Care Panel felt should be referred to them. While each subspecialist was responsible for responding to only those ICDAs referred to his subspecialty, the six subspecialists nonetheless interacted as a group, exchanging viewpoints on each ICDA and reaching agreement on most items. What follows is a general description of the responses of all the subspecialists. In Appendix C, the complete responses of panelists involved in estimating requirements for all the subspecialties are presented.

As in the case of general pediatrics, the subspecialists first reviewed background reference data provided them. In several instances the pediatric subspecialists changed the referral estimates generated by

the Child Medical Care Delphi Panel. The pediatric allergist in particular felt that a greater percentage of patients should be referred from the general child care provider to his subspecialty. Secondly, the consultants designated the percentage of visits that should accrue to their subspecialty from sources other than general child care providers. In the vast majority of the cases, the subspecialists adopted the "triage" function of the general child care provider; where they did not, they specified the other referring physician. There was agreement among the subspecialists that very little of their time should be spent in generalist care. The range was from 0 for the pediatric allergist to 10 percent for the pediatric endocrinologist.

Upon designating which portion of patients should be referred to them, the subspecialists focused upon determining appropriate norms of care to be provided by them for each condition along a similar vein. Utilizing the 1990 norms of care (visits) provided to them by the Child Medical Care Delphi Panel as a reference, the subspecialists determined the norms of care applicable to their subspecialty for each ICDA. The determination of the norms of care was dependent upon the role of the subspecialist (consultation or treatment) in each encounter and the severity of the condition.

Panelists then proceeded to estimate the portion of visits that should be delegated to nonphysician health care providers. With the exception of the pediatric allergist, delegation appeared to contribute insignificantly to the subspecialists' practice content.

In Figure 3, an outline of the ambulatory generic model used by the subspecialists in determining physician requirements is presented.

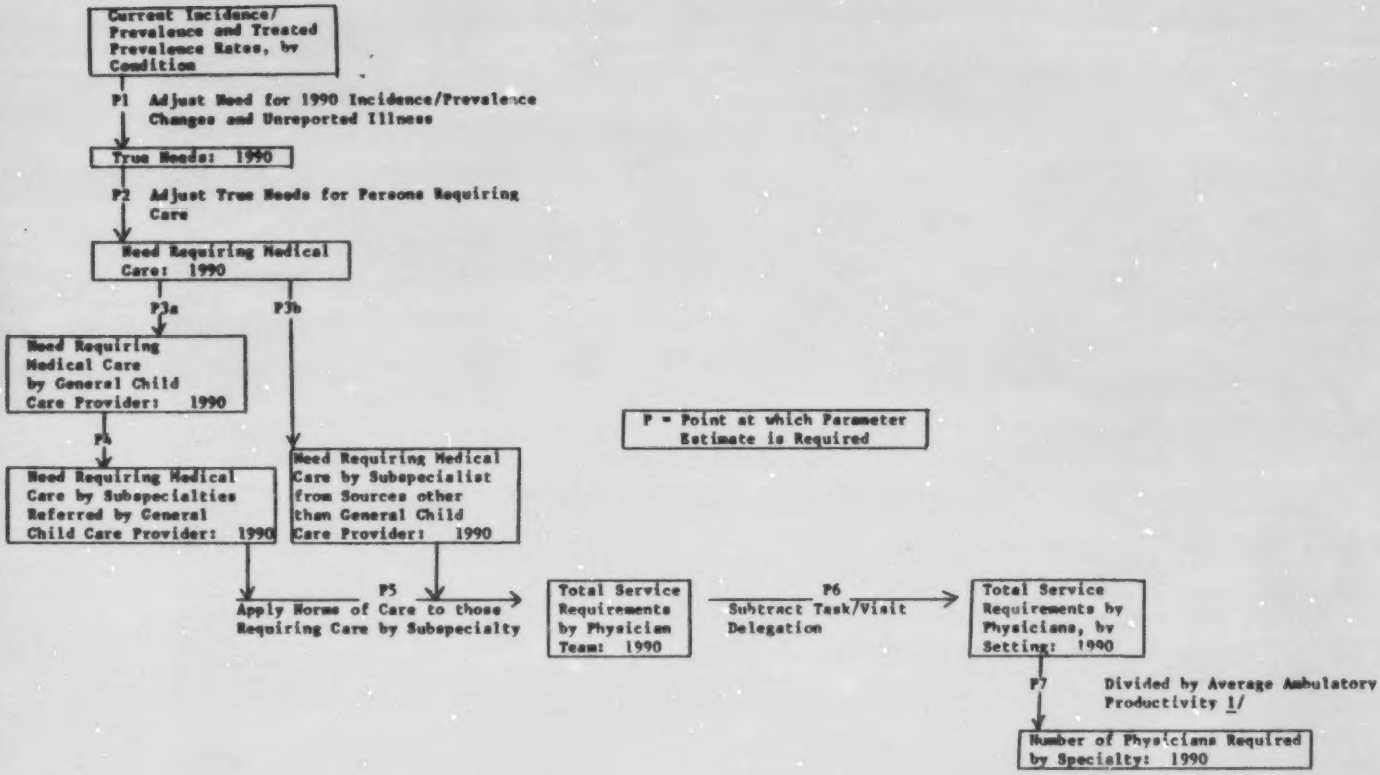
Hospital Care Requirements

In determining hospital service requirements, panelists utilized reference data from the HDS. These data include discharge rates per 10,000 children 0 thru 14 years of age and average lengths of stay data for select conditions. Panelists utilized the discharge data as baselines in determining "true hospital" need for 1990. The data provided on lengths of stay served as guidelines in determining the associated norms of care provided by subspecialists for each hospitalized day.

Generally, the subspecialists' responses on "true need" agreed with the reference data given. However, increases in hospitalization rates for 1990 were made for malignant neoplasms, anemias, and diseases of the circulatory system. The panelists' estimates of the number of visits per ICDA varied with the severity and complexity of the condition and whether the purpose was for consultation or care. Estimated normative delegation of hospital visits in 1990 was judged to be nil.

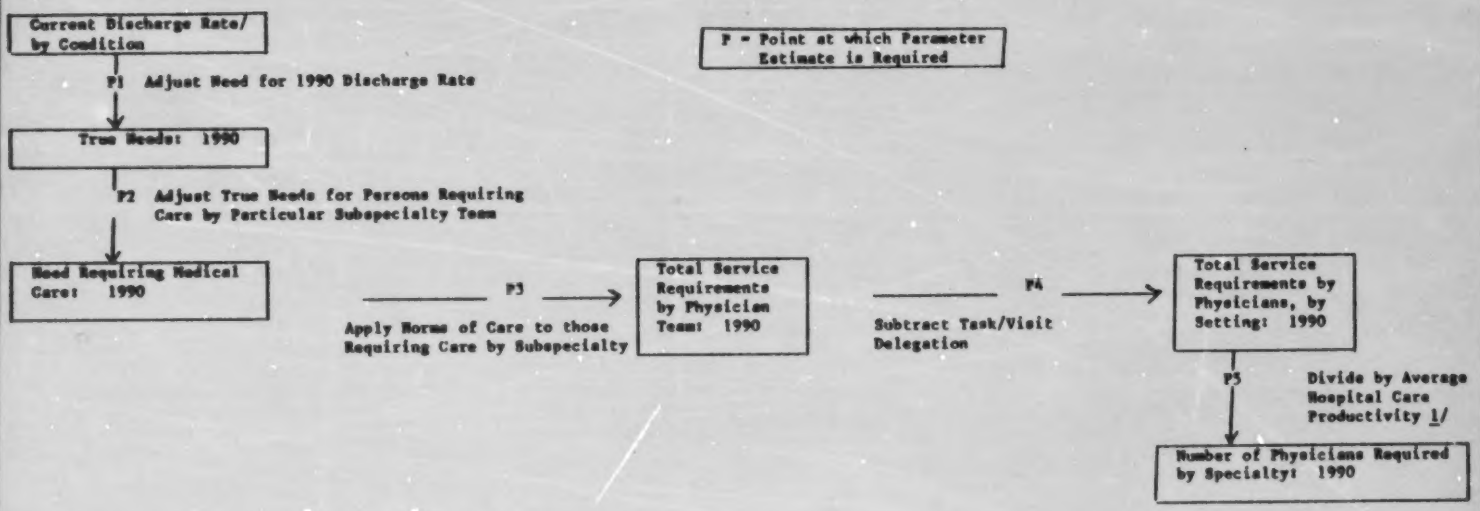
Figure 4 outlines the generic hospital approach used by subspecialists in determining their physician requirements in 1990. In Figure 5, a combination model which includes ambulatory and hospital services together is presented. The sums of services developed in Figures 3 and 4 are added together and divided by the average annual ambulatory and hospital productivity of the average subspecialist in order to derive total physician headcounts in each subspecialty.

FIGURE 3: ADJUSTED AMBULATORY MODEL UTILIZED BY PEDIATRIC SUBSPECIALTIES


Current Incidence/ Prevalence and Treated Prevalence Rates, by Condition
P1 Adjust Need for 1990 Incidence/Prevalence Changes and Unreported Illness
True Needs: 1990
P2 Adjust True Needs for Persons Requiring Care
Need Requiring Medical Care: 1990
P3a
P3b
Need Requiring Medical Care by General Child Care Provider: 1990
P4
Need Requiring Medical Care by Subspecialties Referred by General Child Care Provider: 1990
Need Requiring Medical Care by Subspecialist from Sources other than General Child Care Provider: 1990
P = Point at which Parameter Estimate is Required
P5
Apply Norms of Care to those Requiring Care by Subspecialty
Total Service Requirements by Physician Team: 1990
P6
Subtract Task/Visit Delegation
Total Service Requirements by Physicians, by Setting: 1990
P7
Divided by Average Ambulatory Productivity 1/
Number of Physicians Required by Specialty: 1990

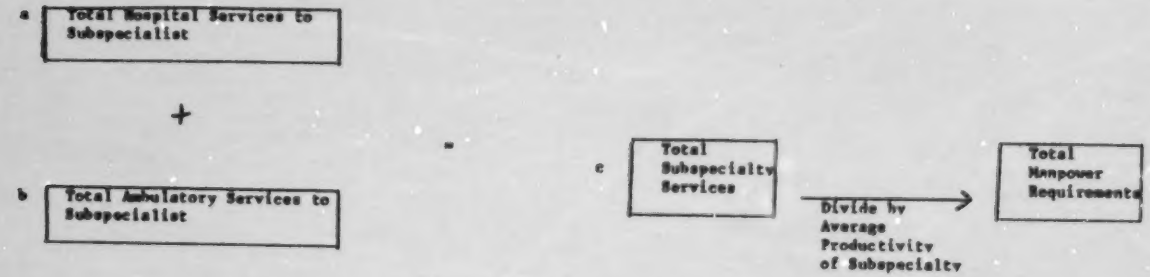
1/ Accounts for time in non-health care activities except for Allergy where the number of physicians needed for non-health care activities was added on to the number in health care activities.

FIGURE 4: ADJUSTED HOSPITAL MODEL UTILIZED BY PEDIATRIC SUBSPECIALTIES


Current Discharge Rate/ by Condition
P1 Adjust Need for 1990 Discharge Rate
True Needs: 1990
P2 Adjust True Needs for Persons Requiring Care by Particular Subspecialty Team
Need Requiring Medical Care: 1990
P3
Apply Norms of Care to those Requiring Care by Subspecialty
Total Service Requirements by Physician Team: 1990
P4
Subtract Task/Visit Delegation
Total Service Requirements by Physicians, by Setting: 1990
P5
Divide by Average Hospital Care Productivity 1/
Number of Physicians Required by Specialty: 1990
P = Point at which Parameter Estimate is Required

1/ Accounts for time in non-health care activities.

FIGURE 5: COMBINATION OF AMBULATORY AND HOSPITAL MODELS FOR PEDIATRIC SUBSPECIALTIES



Productivity

In order to convert service requirements into headcounts for each subspecialty total service requirements were divided by physician productivity. The productivity estimates generally reflect the productivity of the average professionally active pediatric subspecialist, whether engaged in research, teaching, administration, or patient care 1/. They were calculated by multiplying the number of visits handled per week by the number of weeks worked per year. The number of weeks worked per year in 1990 was estimated to be 46 for the neonatologist; all the other pediatric subspecialties foresaw working 47 weeks per year in 1990. The number of nonhospital visits a week ranged from none for the neonatologist to 120 for the pediatric allergist. In contrast, the hospital visits per week varied from the neonatologist's estimate of 104 to the pediatric allergist's estimate of two. For the individual estimates of the subspecialists' productivity see Table 9.

Impact of Adult Requirements on Pediatric Subspecialty Requirements

The data bases given as reference as well as the panelists' responses focused on patients through the age of 16 years for the ambulatory care model and through the age of 14 years for the hospital care model. Hence, panelists had to adjust their service requirements' estimation for the percentage of their practice in 1990 that should be focused on patients above these ages. These estimates were used to increase the manpower requirements. Nearly all subspecialists felt that 15 percent of their ambulatory practices in 1990 should be comprised of persons over 16 years of age. However, the subspecialist in pediatric hematology-oncology predicted only 7.5 percent of patients should be greater than 16 years of age. The percentage of patients greater than 14 years seeing a pediatric subspecialist in the hospital ranged from 10 to 20 percent 2/.

In the following sections of this Chapter, details of the modeling process for each subspecialty are presented.

1/ In pediatric allergy, the productivity estimates were provided for physicians primarily engaged in the provision of patient care. Adjustments in the total number of physicians required for 1990 were then made to account for teaching, research, and administration needs.

2/ It should be noted that these estimates do not pertain to neonatology which provides care only for persons under one year of age.

TABLE 9

NEED FOR SERVICES AND HEALTH CARE PRODUCTIVITY
IN 1990 FOR THE SIX PEDIATRIC SUBSPECIALTIES

Response	Number of Weeks Worked per Year	Number of Hours per Week in Dir. Patient Amb. Care	Number of Hospital Hours per Week	Number of Professional Hours per Week in Non-Patient Care Activities	Total Number of Hours per Week Engaged in Professional Activity	Number of Non-Hospital Visits per Week to Subspecialist	Number of Hospital Visits per Week by Subspecialist	Percent Added to Subspecialists' Practice to Account for:		
								Ambulatory Care for Patients Older Than 16 years	Hospital Care for Patients Older Than 14 years	Time Which Should be Spent in Generalist Care
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Endocria.	47	15	5	30	50	40	10	15	15	10
Allergy	47	44	4	12	60	120	2	15	20	0
Cardiology	47	10	33	21.2	64.2	25	45	15	10	1
Nephrology	47	12	30	18	60	12	35	15	15	1-2
Hem./Onc.	47	20	10	30	60	37.5	18.75	7.5	10	1
Neonat.	46	0	36	29	65	0	104	0	0	5

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NEONATOLOGY

Delphi Responses

As reference material for the deliberations of the Child Medical Care Panel, the neonatologist presented two versions of a needs-based methodology. These methodologies were developed to more closely focus on the unique issues of this subspecialty as contrasted with the needs-based methodology appropriate to the other pediatric subspecialties.

Model A

A model developed by the American Academy of Pediatrics Committee on the Fetus and Newborn Section by Perinatal Pediatrics was presented. Staff adjusted this needs-based model to incorporate data from the 1990 census estimate. This model was based upon the number of neonates requiring special care in Level II and Level III hospitals per length of stay in these centers. Such centers provide specialized services for newborns and are described in footnote 1/ of Table 10.

On the assumption that 7 percent of neonates require initial level II care plus 75 percent of level III patients who graduate will require level II care, a total of 10 percent of live births require level II care. (See footnote 2/ to Table 10 for a definition of level II care). Using the projected birthrates of 3,987,000 for 1989-1990 results in a projection that 398,650 neonates will require level II care in 1990.

Using this methodology, 1990 requirements for neonatologists for level II care are projected at 458 (assuming an average stay of 10 days and that 50 percent of level II patients are managed by neonatologists at 12 patients daily per neonatologist); and 700 for level III needs. Thus, use of this model results in a combined requirement of 1,158 neonatologists. Table 11 displays this model.

Model B

The second needs-based model presented by the neonatologist was based on a summary and recommendations of a report to the Boston University Center for Health Planning by Dr. Paul R. Swyer, Chief of Perinatal Medicine at the Hospital for Sick Children in Toronto, Canada.

As calculated from this data, 30 neonates per thousand live births will require initial level III care and 70 neonates per 1,000 live births will require initial level II care. This converts to an estimated 450 neonates per million population who will require initial level III care; of these, 375 will graduate to require level II care and an additional 1,050 will require initial level II care. Assuming a projected 1990 U.S. population of 243.5 million (as derived from the 1990 census estimate) and a mean of 672 neonates per neonatologist per year, this methodology results in an estimated requirement of 1,460 neonatologists. Table II displays this model.

Modeling Panel Recommendations

In reviewing the requirements for neonatology, the Modeling Panel made no changes to individual data points. The Panel did, however, recommend acceptance of a range between 1,250 and 1,350 neonatologists for 1990 instead of relying upon a single number.

TABLE 10

NUMERICAL ESTIMATES OF NEWBORNS REQUIRING SPECIAL CARE AND RESULTING NEONATOLOGISTS REQUIRED: MODEL A

	Level III 1/ (Intensive)	Level II 2/ (Intermediate & Continuing)			
Neonates requiring care/1,000 live births	40/1000	70/1000	+	30/1000 graduates of Level III	
Total neonates/year 2/	159,460	279,050	+	119,600 =	398,650
Average length stay (days)	10	10	+	10	
Patient days/year	1,594,600	2,790,500	+	1,196,000 =	3,986,500
Average daily patient census	4,368	7,644	+	3,358 =	11,002
Number of Level II Neonatologists required					458 4/
Number of Level III Neonatologists required	700 5/				
Total number required		1,158			

1/ Level III hospitals function as regional centers and provide all aspects of perinatal care, including intensive care and a broad range of continuously available subspecialty consultation.

2/ Level II hospitals have the capability for resuscitation, short-term assisted ventilation with bag and mask or endotracheal tube, intravenous therapy with infusion pumps, arterial blood gas monitoring, continuous cardiorespiratory monitoring with appropriate equipment, performance of exchange transfusion, and oxygen administration.

3/ Based on 3,987,000 birth/yr. which is taken from an estimate from the 1990 Census.

4/ Assumes one-half of Level II patients managed by neonatologist, at 12 patients per neonatologist.

5/ Mean of numbers required assuming eight patients per neonatologist (546), six patients per neonatologist (728), and an estimate derived from the suggested need to utilize three neonatologists to staff each of 275 Level III units identified as currently serving the U.S. (825).

TABLE 11

NUMERICAL ESTIMATES OF NEWBORNS REQUIRING SPECIAL CARE AND RESULTING NEONATOLOGISTS REQUIRED: MODEL B

	Level III	Level II
(1) Population base (millions)	1	1
(2) Number Live Births (16/1000 pop.)	15,000	15,000
(3) Incidence Low Births Weight/1000 live births	70	70
(4) Needing level care/1000 live births	30	70
(5) Patients/year	450	1,425
From Level II		(1,050)
From Level III		(375)
(6) Length of stay (days)	10	7
(7) Patient days/year	4,500	9,975
(8) Neonatologists/million pop. (equivalents)	3	3

The model results in an estimate of six neonatologists needed per 1,000,000 population. Using a projected U.S. population of 243.5 million results in 1,460 neonatologists needed.

PEDIATRIC ENDOCRINOLOGY

Delphi Responses

Based on the pediatric endocrinologist's perception of those morbidities that should be referred to the subspecialty, the panelist considered a total of 17 ICDAs. The ICDA morbidities of precocious sexual development (42.8 percent); congenital disorders of carbohydrate metabolism, congenital disorders of lipid metabolism, gout, and other hyperalimentation (15.6 percent); and short stature and delayed adolescence (14.3 percent) comprised 72.7 percent of the visits that determined manpower requirements for pediatric endocrinologists for 1990. A total of 1.5 million visits were projected to be required by the pediatric endocrinologist in 1990. This estimate accounts for 15 percent of the pediatric endocrinologists' practices which should be spent in adult care and 10 percent which should be spent in generalist care in 1990. Table 12 displays those conditions which impacted significantly on the requirements.

In order to convert service requirements into physician headcounts it is necessary to estimate the average productivity of a pediatric endocrinologist. The panelist felt that in 1990, a total of 1,800 nonhospital visits should be provided annually by the average pediatric endocrinologist. This assumes that the average pediatric endocrinologist makes 40 nonhospital visits weekly for 47 weeks per year. By dividing service requirements by the annual productivity, a total of 899 pediatric endocrinologists should be needed in 1990.

In comparison to the 899 pediatric endocrinologists estimated for 1990, supply projections indicate there will be 250 in practice in 1990. Thus, the expert pediatric endocrinologist predicted over a 3.5 fold increase in the number of pediatric endocrinologists required in 1990 over the projected supply.

Modeling Panel Recommendations

In reviewing the pediatric endocrinology data, the Modeling Panel considered the potential impact that internal medicine endocrinologists will have on the practice of pediatric endocrinology. Consequently, the Modeling Panel decreased the 1990 pediatric endocrinology requirements by approximately 12 percent to 791.

TABLE 12

AMBULATORY MORBIDITY CONDITIONS IMPACTING SIGNIFICANTLY ON PEDIATRIC ENDOCRINOLOGY MANPOWER REQUIREMENTS

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Pediatric Endocrinologist (2)	% of Pediatricians' Patients Ages 0-16 to be Referred to Ped. Endocrinologist as Perceived by Ped. Endocrinologist, 1990 (3)	% Requiring Health Care that Should be Seen by Endocrinologist from Sources, other than General Pediatricians, 1990 (4)	1990 Ambulatory Norms of Care (Visits) for Ped. Endocrinology as Perceived by Ped. Endocrinologist (5)	% of Visits to Endocrinologist that Should be Delegated to Non-Physician Health Care Providers as Perceived by Ped. Endocrinologist, 1990 (6)	% Share of Ambulatory Visits Accruing to Pediatric Endocrinologist (7)
MOS 2 Precocious sexual development	900	50	0	2.0	0	42.8
Other (270-279) (271 Congenital disorders of carbohydrate metabolism) (272 Congenital disorders of lipid metabolism) (274 Gout) (278 Other hyperalimentation)	109	100	0	3.0	0	15.6
MOS 1 Short stature and delayed adolescence	3,000	10	0	1.0	0	14.3

TABLE 13

SUMMARY OUTPUT OF THE CHILD MEDICAL CARE SUBSPECIALTY DELPHI PROCESS IN PEDIATRIC ENDOCRINOLOGY

	Ambulatory Model	
	Before Delegation	After Delegation
1) Number of Ambulatory Child Morbidity Visits 1/	1,547,831	1,521,325
2) Number of Nonhospital Visits per Endocrinologist per Year	1,880	1,880
3) Number of Pediatric Endocrinologists Required 2/	914	899

1/ Adjusted to account for 15 percent of the endocrinology ambulatory morbidity-specific practice in 1990 which focuses on patients older than 16 years of age.

2/ Adjusted to account for the fact that 10 percent of the practice of pediatric endocrinology should consist of generalist care in 1990.

NOTE: These requirements do not take into account the impact of the internal medicine subspecialty of endocrinology on child care. This impact was later considered by the Modeling Panel and can be found in Table 22.

PEDIATRIC HEMATOLOGY-ONCOLOGY

Delphi Responses

Requirements for pediatric hematology-oncology were developed for hospital and ambulatory care, with the latter comprising 64 percent of the total practice. The hematologist-oncologist utilized slightly over 20 ICDAs in both the ambulatory and hospital settings. The selection was based on the perception of those morbidities that should be referred to the subspecialty in 1990. In addition, the expert consultant increased ambulatory visits by 7.5 percent and hospital visits by 10 percent to respectively account for persons aged 17 and over and 15 and over. The ICDA morbidities of other deficiency anemias, acquired hemolytic anemias, aplastic anemias, other and unspecified anemias, coagulation defects, and purpura and other hemorrhagic conditions as seen in the ambulatory setting comprised 51.4 percent of all ambulatory and hospital visits. Malignant neoplasms seen in the hospital constituted 17.9 percent of all hospital and ambulatory visits. An additional 1 percent of all service requirements was added to the total need in order to account for the small amount of generalist care provided by the pediatric hematologist-oncologist. Total hospital and ambulatory visits were added and divided by the total productivity of the average pediatric hematologist-oncologist.

In calculating ambulatory requirements, the expert consultant estimated the annual productivity of the pediatric hematologist-oncologist to be 1,763 visits. This number of nonhospital visits per hematologist-oncologist was the result of multiplying 47 weeks per year by 37.5 visits per week in 1990. This estimate was added to the hospital productivity in order to arrive at the total patient care productivity of the average pediatric hematologist-oncologist. This latter figure was estimated at 881 hospital visits per year (18.75 visits per week x 47 weeks per year = 881 visits).

Table 14 displays the conditions which accounted for a major part of the workload. Table 15 summarizes the manpower requirement for pediatric hematology-oncology without accounting for the impact of the internal medicine subspecialty of hematology-oncology on child care. According to the judgments of the expert consultant, a total of 1,929 pediatric hematologists-oncologists should be required in 1990.

If estimates for pediatric hematologists-oncologists were calculated solely on the basis of their ambulatory care service requirements (as seen in Table 15) comparable results are found. Dividing all ambulatory care by the average number of non-hospital visits handled annually by pediatric hematologists-oncologists results in a need for 1,856 physicians in 1990. Thus, although results are obtained utilizing different procedures, consistency of requirements is achieved.

Modeling Panel Recommendations

Upon taking the impact of the internal medicine subspecialty of hematology-oncology into account, the Modeling Panel reduced the 1990 requirements of pediatric hematologists-oncologists by 16 percent. The Panel recommended a need for 1,617, which it later changed to a range between 1,600 and 1,700.

TABLE 14

AMBULATORY AND HOSPITAL MORBIDITY CONDITIONS IMPACTING SIGNIFICANTLY ON PEDIATRIC HEMATOLOGY-ONCOLOGY MANPOWER REQUIREMENTS

Ambulatory

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Ped. Hem./Onc. (2)	% of Pediatricians' Patients Ages 0-16 to be Referred to Ped. Hem./Onc. as Perceived by Ped. Hem./Onc., 1990 (3)	% Requiring Health Care that Should be Seen by Ped. Hem./Onc. from Sources, other than General Pediatricians, 1990 (4)	1990 Ambulatory Norms of Care (Visits) for Ped. Hem./Onc. as Perceived by Ped. Hem./Onc. (5)	% of Visits to Ped. Hem/Onc. that Should be Delegated to Non-Physician Health Care Providers as Perceived by Ped. Hem/Onc., 1990 (6)	% Share Total Visits (Hosp. & Amb.) Accruing to Pediatric Hem./Onc. (7)
Other (280-289) (281 Other deficiency anemias) (283 Acquired hemolytic anemias) (284 Aplastic anemia) (285 Other and unspecified anemias) (286 Coagulation defects) (287 Purpura and other hemorrhagic conditions)	1,074	90	0	4.0	0	51.4

Hospital*

Column	1	2	3	4	5	6	7	8
ICDA Number	Diagnosis	Number of Discharges per 10,000 Population, ages 0-14 1975	True Need per 10,000 Population, 1978	Percent Rate Change in True Need 1978 to 1990	Percent of Adjusted Need Should be Seen by Pediatric Hem./Onc., 1990	Number of Hospital Visits Should be Made by Pediatric Hem./Onc., 1990	Percent of Visits Should be Delegated to Nonphysician Providers, 1990	% Share of Total Visits (Hosp. & Amb.) Accruing to Pediatric Hem./Onc.
140-209	Malignant Neoplasms	4.7	5.7	+25	100	21.2	0	17.9

* Column 2 is the HDS reference for column 3.
Columns 3, 4, 5, 6, and 7 represent the perceptions of the Pediatric Hematologist/Oncologist.

TABLE 15

SUMMARY OUTPUT OF THE CHILD MEDICAL CARE SUBSPECIALTY DELPHI PROCESS IN PEDIATRIC HEMATOLOGY-ONCOLOGY

	Ambulatory Model		Amublatory & Hospital Model	
	Before Delegation	After Delegation	Before Delegation	After Delegation
1) Number of Ambulatory Child Morbidity Visits 1/	3,444,718	3,240,397	3,444,718	3,240,397
2) Number of Hospital Child Morbidity Visits 2/	--	--	1,809,662	1,809,662
3) Number of Nonhospital Visits per Hematologist-Oncologist per Year	1,763	1,763	1,763	1,763
4) Number of Hospital Visits per Hematologist-Oncologist per Year	--	--	881	881
5) Number of Pediatric Hematologists-Oncologists Required 3/	1,974	1,856	2,007	1,929

1/ Adjusted to account for 7.5 percent of the hematology-oncology ambulatory morbidity-specific practice in 1990 for patients older than 16 years of age.

2/ Adjusted to account for 10 percent of the hematology-oncology hospital morbidity-specific practice in 1990 for patients older than 14 years of age.

3/ Adjusted to account for an additional 1.0 percent of the total time which should be spent in generalist care.

Note: These requirements do not take account of the impact of the internal medicine subspecialty of hematology-oncology on child care. This impact was later considered by the Modeling Panel and can be found in Table 22.

PEDIATRIC NEPHROLOGY

Delphi Responses

Requirements for pediatric nephrology were estimated in the same manner as those for hematology-oncology. The pediatric nephrologist considered approximately 20 ICDAs in the ambulatory and hospital settings. Approximately 90 percent of all visits were expected to be seen in the hospital. Diseases of the genitourinary system seen in the hospital setting were expected to comprise 64.1 percent of all hospital and ambulatory visits. Visits in the ambulatory sector were basically comprised of strictures of the urethra and other diseases of the urinary tract. Before converting service requirements into manpower requirements, the expert consultant increased ambulatory and hospital service needs to account for care provided to adults. Hospital visits and ambulatory visits were each increased by 15 percent to account for persons over the ages of 14 and 16, respectively. Table 16 displays in detail the conditions which were significant manpower determinants for pediatric nephrology for 1990.

The expert estimated a total of 1,645 hospital visits per pediatric nephrologist per year which was based on working 47 weeks a year and making 35 hospital visits per week in 1990. The estimate of 564 nonhospital visits per pediatric nephrologist per year was attributed to 12 nonhospital visits per week for 47 weeks. The manpower requirements for 1990 were increased by 1.5 percent to account for time which should be spent in generalist care. Table 17 summarizes the manpower requirements.

A total of 369 pediatric nephrologists were predicted to be required in 1990. This estimate is 32 percent greater than requirements estimated using an ambulatory model. Note that these requirements do not account for the impact of the internal medicine subspecialty of nephrology on child care. This impact was later considered by the Modeling Panel of GMENAC and can be found in Table 22.

Modeling Panel Recommendations

In considering the impact of the internal medicine subspecialty of nephrology on child requirements, the Modeling Panel estimated that pediatric nephrology requirements should be reduced by 34 percent to 242 physicians. However, the Modeling Panel recommended that only a small portion of this impact should be realized in 1990. Consequently, the Panel recommended that a median of 325 pediatric nephrologists be required in 1990, a difference of 12 percent from the requirement estimated by the expert consultant.

Table 16

AMBULATORY AND HOSPITAL MORBIDITY CONDITIONS IMPACTING SIGNIFICANTLY ON PEDIATRIC NEPHROLOGY MANPOWER REQUIREMENTS

Ambulatory

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Pediatric Nephrologist (2)	% of Pediatricians' Patients Ages 0-16 to be Referred to Ped. Nephrologist as Perceived by Ped. Nephrologist, 1990 (3)	% Requiring Health Care that Should be Seen by Ped. Nephrologist from Sources, other than General Pediatricians, 1990 (4)	1990 Ambulatory Norms of Care (Visits) for Ped. Nephrology as Perceived by Ped. Nephrologist (5)	% of Visits to Ped. Nephrologist that Should be Delegated to Non-Physician Health Care Providers as Perceived by Ped. Nephrologist, 1990 (6)	% Share of Total Visits (Hospital & Ambulatory) Accruing to Pediatric Nephrologist (7)
598 Stricture of urethra 599 Other diseases of urinary tract	124	100	0	1.0	25	8.3

Hospital*

Column	1		2	3	4	5	6	7	8
ICDA Number	Diagnosis		Number of Discharges per 10,000 Population, ages 0-14 1975	True Need per 10,000 Population, 1978	Percent Rate Change in True Need 1978 to 1990	Percent of Adjusted Need Should be Seen by Pediatric Nephrologist, 1990	Number of Visits Should be Made by Pediatric Nephrologist, 1990	Percent of Visits Should be Delegated to Nonphysician Providers, 1990	% Share of Total Visits (Hospital & Ambulatory) Accruing to Pediatric Nephrologist
580-629	Diseases of the Genito-urinary System	221	41.2	41.2	0	100	3.8	0	64.1

* Column 2 is the HDS reference for Column 3.
Columns 3, 4, 5, 6, and 7 represent the perceptions of the Pediatric Nephrologist.

TABLE 17

SUMMARY OUTPUT OF THE CHILD MEDICAL CARE SUBSPECIALTY DELPHI PROCESS IN PEDIATRIC NEPHROLOGY

	Ambulatory Model		Ambulatory & Hospital Model	
	Before Delegation	After Delegation	Before Delegation	After Delegation
1) Number of Ambulatory Child Morbidity Visits 1/	188,325	161,371	188,325	161,371
2) Number of Hospital Child Morbidity Visits 2/	--	--	641,720	641,720
3) Number of Nonhospital Visits per Nephrologist per Year	564	564	564	564
4) Number of Hospital Visits per Nephrologist per Year	--	--	1,645	1,645
5) Number of Pediatric Nephrologists Required 3/	339	290	382	369

1/ Adjusted to account for 15 percent of the nephrology morbidity-specific ambulatory practice in 1990 for patients older than 16 years of age.

2/ Adjusted to account for 15 percent of the nephrology morbidity-specific hospital practice in 1990 for patients older than 14 years of age.

3/ Adjusted to account for an additional 1.5 percent of the time which should be spent in generalist care.

Note: These requirements do not account for the impact of the internal medicine subspecialty of nephrology on child care. This impact was later considered by the Modeling Panel of GMENAC and can be found in Table 22.

PEDIATRIC CARDIOLOGY

Delphi Responses

The pediatric cardiologist responded to approximately 18 individual and grouped ICDAs in ambulatory and hospital settings based on the General Child Medical Care Delphi panelists' perception of those morbidities that should be referred to the subspecialty. Approximately 60 percent of all visits were expected to be made in the hospital in 1990. The hospital visits for congenital anomalies of heart (23.5 percent) and diseases of the circulatory system (20.5 percent) comprised 43.9 percent of all visits (hospital and ambulatory). Congenital anomalies of heart when seen in the ambulatory setting comprised 22.4 percent of ambulatory visits. Table 18 displays the conditions which should be significant manpower determinants for pediatrics cardiology in 1990. The expert consultant increased hospital requirements by 10 percent and ambulatory requirements by 7 percent in order to account for care provided adults by the pediatric cardiologist. These total requirements were then adjusted by 1 percent to account for general care provided by the pediatric cardiologist, which amounted to 1 percent of total non-general health related requirements.

Manpower requirements were calculated by summing the ambulatory and hospital productivity of the average pediatric cardiologist and dividing the figure into the total service requirements. An annual hospital productivity of 2,215 visits was calculated by multiplying 45 weekly visits by 47 weeks per year. This was added to the ambulatory productivity of 1,175 annual visits (25 weekly visits X 47 weeks per year = 1,775 visits) for a total productivity of 3,390 visits.

In Table 19, the total manpower requirements for 1990 are displayed. A total of 1,133 pediatric cardiologists are estimated for 1990. This figure is 13 percent less than requirements solely based on the ambulatory component of the pediatric cardiologist's practice.

Modeling Panel Recommendations

The Modeling Panel recommended a reduction in the number of visits accruing to the subspecialty of pediatric cardiology by applying a simultaneity factor of 1.6 conditions per visit as derived from NAMCS to the ambulatory portion of the pediatric cardiological requirements. The GMENAC plenary session participants felt that since the pediatric cardiologist will be handling primarily cardiological conditions, he/she will not be seeing more than one cardiological condition per visit. Therefore, no reduction in the number of visits accruing to the pediatric cardiologist was recommended by the entire committee.

The Modeling Panel initially reduced the total of 1,133 pediatric cardiologists required for 1990 by 4 percent to account for care provided children by the internal medicine subspecialty of cardiology. However, GMENAC finally recommended a median of 1,150 pediatric cardiologists; this figure is approximately equal to the estimate projected by the expert consultant. Supply projections for 1990 indicate there will be 1,000 FTE pediatric cardiologists in practice by 1990, which is comprised of 850 practicing pediatric cardiologists and 400 residents, each of which is assumed to be equal to 35 percent of a physician.

TABLE 18

AMBULATORY AND HOSPITAL MORBIDITY CONDITIONS IMPACTING SIGNIFICANTLY ON MANPOWER REQUIREMENTS IN PEDIATRIC CARDIOLOGY

Ambulatory

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Pediatric Cardiologist (2)	% of Pediatricians' Patients Ages 0-16 to be Referred to Ped. Cardiologist as Perceived by Ped. Cardiologist, 1990 (3)	% Requiring Health Care that Should be Seen by Ped. Cardiologist from Sources, other than General Pediatricians, 1990 (4)	1990 Ambulatory Norms of Care (Visits) for Ped. Cardiology as Perceived by Ped. Cardiologist (5)	% of Visits to Ped. Cardiologist that Should be Delegated to Non-Physician Health Care Providers as Perceived by Ped. Cardiologist, 1990 (6)	% Share of Total Visits (Hospital and Ambulatory) Accruing to Pediatric Cardiologist (7)
746 Congenital anomalies of heart	642	100	0	2.0*	0	22.4

Hospital 1/

Column	1	2	3	4	5	6	7	8
ICDA Number	Diagnosis	Number of Discharges per 10,000 Population, ages 0-14 1975	True Need per 10,000 Population, 1978	Percent Rate Change in True Need 1978 to 1990	Percent of Adjusted Need Should be Seen by Pediatric Cardiologist, 1990	Number of Hospital Visits Should be Made by Pediatric Cardiologist, 1990	Percent of Visits Should be Delegated to Nonphysician Providers, 1990	% Share of Total Visits (Hospital & Ambulatory) Accruing to Pediatric Cardiologist
740-759	Congenital Anomalies	31.3	31.3	0	40	12	0	23.5
390-458	Diseases of the Circulatory System	6.8	10.0	+30	100	10	0	20.4

* Annualized

1/ Column 2 is the HDS reference for Column 3.
Columns 3, 4, 5, 6, and 7 represent the perceptions of the Pediatric Cardiologist.

TABLE 19

SUMMARY OUTPUT OF THE CHILD MEDICAL CARE SUBSPECIALTY DELPHI PROCESS IN PEDIATRIC CARDIOLOGY

	Ambulatory Model		Ambulatory & Hospital Model	
	Before Delegation	After Delegation	Before Delegation	After Delegation
1) Number of Ambulatory Child Morbidity Visits 1/	1,510,274	1,510,274	1,510,274	1,510,274
2) Number of Hospital Child Morbidity Visits 2/	--	--	2,291,943	2,291,943
3) Number of Nonhospital Visits per Cardiologist per Year	1,175	1,175	1,175	1,175
4) Number of Hospital Visits per Cardiologist per Year	--	--	2,215	2,215
5) Number of Pediatric Cardiologists Required 3/	1,298	1,298	1,133	1,133

1/ Adjusted to account for 7 percent of the cardiology morbidity-specific ambulatory practice in 1990 for patients older than 16 years of age.

2/ Adjusted to account for 10 percent of the cardiology morbidity-specific hospital practice in 1990 for patients older than 14 years of age.

3/ Adjusted to account for an additional 1.0 percent of the time which should be spent in generalist care.

Note: These requirements do not account for the impact of the internal medicine subspecialty of cardiology on child care. This impact was later considered by the Modeling Panel of GMENAC and can be found in Table 22.

PEDIATRIC ALLERGY

Delphi Panel Responses

The pediatric allergist responded to a total of 13 ICDAs seen in the ambulatory setting based on the panelists's perception of those morbidities which should be referred to the subspecialty. The ICDAs of hay fever (32.7 percent), asthma (27.2 percent), bronchitis, unqualified and chronic bronchitis (20.6 percent), and chronic sinusitis (15.6 percent) comprise 96.1 percent of the projected visits for 1990. Hay fever is generally a nonlife threatening disease which has a significant impact on the number of pediatric allergists required. Table 20 displays those conditions which impact significantly on the requirements for pediatric allergy for 1990 and compares them with Modeling Panel revisions.

Higher referral rates from the generalist to the subspecialty were estimated by the pediatric allergist than that developed by the Child Medical Care Delphi Panel. The pediatric allergist perceived that increasing technology and more complicated therapeutic procedures will become available in the future, hence, requiring greater utilization of the subspecialty's services. For example, the allergist pointed out that imminent changes in formulation and availability of biologicals will add new dimensions to the diagnosis, treatment and even the "cure" of asthma and hay fever through such mechanisms as alteration of the T-cell function.

Before estimating the productivity of the pediatric allergist, adjustments were made for the care provided adults and delegation to the nonphysician health care provider. It was estimated that 15 percent of the pediatric allergist's ambulatory practice should be devoted to adult care in 1990. Furthermore, 25 percent of all visits were deemed delegable to the nonphysician health care provider.

Panelists estimated that the average nonhospital capacity of patient care allergists per year should be 5,640 in 1990. This was based on 47 work weeks per year and 120 nonhospital visits per week. Upon dividing the total service requirements by the productivity of the average practicing pediatric allergist, a total of 3,037 pediatric allergists are required for 1990.

Since the expert consultant in pediatric allergy developed physician requirements for the average pediatric allergist engaged in patient care activities and not the average pediatric allergist, the total number of physicians needed for 1990 were adjusted upwards. The expert consultant estimated that 10 percent of all pediatric allergists should be engaged in nonpatient care activities in 1990, resulting in a total need of 3,374 pediatric allergists required for 1990 (after delegation).

Modeling Panel Recommendations

In March, 1980 the Modeling Panel reviewed the Pediatric Subspecialty Delphi Panel results. It recommended the following changes to the pediatric allergy data which reduced the number of aggregate visits accruing to the subspecialty:

1. For ICDAs 490-1, Bronchitis, the percentage referred to the pediatric allergist from the general pediatrician was reduced from 55 to 20 percent.

2. For ICDA 493, Asthma, the percentage referred to the pediatric allergist from the general pediatrician was reduced from 85 to 30 percent.

3. For ICDA 503, Chronic Sinusitis, the percentage referred to the pediatric allergist from the general pediatrician was reduced from 90 to 15 percent.

4. For ICDA 507, Hay Fever, the percentage referred to the pediatric allergist from the general pediatrician was reduced from 70 to 20 percent.

The Modeling Panel also recommended a 21 percent reduction in the number of visits accruing to the pediatric allergist based on simultaneity data derived from NAMCS which indicated that the average pediatric allergist currently handles 1.284 conditions per visit. The GMENAC Plenary Session participants felt that the 1.284 conditions per visit included simultaneity for both generalist and allergy conditions. Therefore, GMENAC reduced the factor to 1.200 to apply solely for allergy related conditions.

The rationale for the Modeling Panel changes was that the subspecialist's estimate of 3,374 pediatric allergists is not achievable by 1990. Between now and 1990, there is a need to upgrade the skills of some of the currently practicing pediatric allergists, and to assure that current and future training programs in allergy and immunology incorporate the latest research and technology in the curricula. As a reasonable and achievable target, the Modeling Panel recommended a median of 900 pediatric allergists for 1990. This range accounts for the impact of the internal medicine subspecialty of allergy on pediatric allergy requirements. Without this impact, the total number of pediatric allergists required equals 1,020. Supply projections for 1990 indicate there will be 900 FTE pediatric allergists in practice; a figure which is comprised of 750 physicians and 450 residents, the latter of whom are equivalent to one-third the total number of patient care physicians.

Tables 20 and 21 summarize the revisions that the Modeling Panel made to the manpower requirements for pediatric allergy. These exclude the impact of the internal medicine subspecialty of allergy on pediatric allergy requirements which is found in Table 22.

TABLE 20

AMBULATORY MORBIDITY CONDITIONS IMPACTING SIGNIFICANTLY ON PEDIATRIC ALLERGY MANPOWER REQUIREMENTS
(EXPERT CONSULTANT AND MODELING PANEL RECOMMENDATIONS)

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Pediatric Allergist (2)	% of Pediatricians' Patients Ages 0 - 16 to be Referred to Ped. Allergy as Perceived by Ped. Allergist, 1990 (3)	% Requiring Health Care that Should be Seen by Ped. Allergy, from Sources other than General Pediatricians, 1990 (4)	1990 Ambulatory Norms of Care (Visits) for Ped. Allergy as Perceived by Pediatric Allergist (5)	% of Visits to Ped. Allergist that Should be Delegated to Non-Physician Health Care Providers as Perceived by Ped. Allergist, 1990 (6)	% Share of Ambulatory Visits Accruing to Pediatric Allergist (7)	
						EXPERT	MODELING PANEL
507 Hay fever	5,000	60 1/	10 (From OTO) 1/, 4/	3.0	40	32.7	21.0
493 Asthma	3,157	80 2/	5 (From PD) 2/, 5/	3.0	20	27.2	26.5
503 Chronic sinusitis	2,923	80	10 (From OTO)	2.0	30	15.6	9.5
490 Bronchitis, unqualified and 491 Chronic bronchitis	4,424	50 3/	5 (From PD) 3/	2.0	0	20.6	15.5

1/ For ICDA 493, the Modeling Panel recommended a 30 percent total referral to the pediatric allergist.
2/ For ICDA 507, the Modeling Panel recommended a 20 percent total referral to the pediatric allergist.
3/ For ICDAs 490-1, the Modeling Panel recommended a 20 percent total referral to the pediatric allergist.
4/ Otorhinolaryngologist
5/ Pulmonary Disease Specialist

TABLE 21

SUMMARY OUTPUT OF THE CHILD MEDICAL CARE SUBSPECIALTY
PEDIATRIC ALLERGY DELPHI PROCESS AND GMENAC RECOMMENDATIONS

AMBULATORY MODEL

	Delphi Process		GMENAC	
	Before Delegation	After Delegation	Before Delegation	After Delegation
1) Number of Ambulatory Child Morbidity Visits 1/	23,236,880	17,125,936	7,093,114 2/	5,179,618 2/
2) Number of Nonhospital Visits per Allergist per Year	5,640	5,640	5,640	5,640
3) Number of Pediatric Allergists Required for Patient Care Activities	4,120	3,037	1,258	918
4) Number of Total Pediatric Allergists Required 3/	4,577	3,374	1,398	1,020

1/ Adjusted to account for 15 percent of the allergy ambulatory practice in 1990 for patients older than 16 years of age.

2/ Adjusted to account for a simultaneity factor of 1.200 conditions per visit.

3/ Adjusted for 10 percent of pediatric allergists who should be engaged in nonpatient care activities.

NOTE: These requirements do not take into account the impact of the internal medicine subspecialty of allergy which is found in Table 22.

COMPARISON OF SUPPLY PROJECTIONS AND GMENAC REQUIREMENTS RECOMMENDATIONS

Table 22 outlines a comparison of the requirements for general pediatrics and its subspecialties with 1990 supply projections for these subspecialties. The supply projections were developed on the assumption that one resident performs the equivalent of 35 percent of patient care activities of a practicing physician (GMENAC Final Report, 1980). Thus, the supply projections developed for GMENAC indicate that in 1990 there will be 35,300 general pediatricians in practice and an additional 7,050 residents, for a projected supply of 37,750 general pediatricians. While supply projections are given for each of the pediatric subspecialties, the AMA Masterfile used as a baseline for supply estimates does not separately identify pediatric subspecialties other than allergy and cardiology. Those subspecialties not identified are probably included in the total number of general pediatricians projected for 1990. Therefore, any supply-requirements comparison should be restricted to the aggregate numbers of general pediatrics and its subspecialties.

This comparison indicates that the range of projected manpower requirements for pediatrics varies from 3,400 to 6,600 less than projected supply. Since the difference between the projected supply and requirements was within 15 percent, GMENAC considered the projected manpower requirements and supply of general pediatrics and its subspecialties to be in "near balance."

TABLE 22

1990 REQUIREMENTS: GENERAL PEDIATRICS AND PEDIATRIC SUBSPECIALTIES

Specialty	(1) Delphi Process Estimates	(2) Estimates After Accounting for Impact of Internal Medicine Subspecialties on Child Care	(3) Final Modeling Panel Estimates 2/	(4) 1990 Supply Estimates
General Pediatricians	38,978	38,978	29,000-31,500	37,750
Ped. Allergists	3,267	924	800-1,000	900
Ped. Cardiologists	1,133	1,092	1,100-1,200	1,000
Ped. Endocrinologists	899	791	700-850	250
Ped. Hematologist/ Oncologists	1,929	1,617	1,600-1,700	550
Ped. Nephrologists	369	242 1/	300-350 1/	200
Neonatologists	1,309	1,300	1,250-1,350	700
TOTAL	47,884	44,944	34,750-37,950 (mean = 36,400)	41,350

1/ While the impact of the nephrologist on child care reduces the requirements for pediatric nephrologists to 242, the Modeling Panel recommended that only a portion of this impact be utilized in determining manpower requirements for the pediatric nephrologist.

2/ GMENAC adopted the requirements estimates made by the Modeling Panel.

APPENDIX A

LIST OF DELPHI
PANEL MEMBERS
FOR
GENERAL CHILD HEALTH CARE
AND
PEDIATRIC SUBSPECIALTY CARE

GRADUATE MEDICAL EDUCATION NATIONAL ADVISORY COMMITTEE

CHILD MEDICAL CARE AND PEDIATRIC SUBSPECIALTY

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GRADUATE MEDICAL EDUCATION NATIONAL ADVISORY COMMITTEE

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GRADUATE MEDICAL EDUCATION NATIONAL ADVISORY COMMITTEE

CHILD MEDICAL CARE AND PEDIATRIC SUBSPECIALTY

DELPHI PANEL

PEDIATRIC SUBSPECIALTY PANELISTS

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Lincoln Hospital
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THORNER, Robert N.
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APPENDIX B

GENERAL CHILD MEDICAL CARE
DELPHI PANEL RESPONSES

TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
I. Infective and Parasitic Diseases (000-136)									
Intestinal Infectious Diseases									
008 Enteritis due to other specified organism	4,730,200	7,877	10,000	0	46	50	48	42	90
009 Diarrheal diseases	2,207,000	3,675	4,500	0	57	50	54	39	95
Other (000-009)	54,800	91	100	0	100	100	-	-	100
(003 Other Salmonella infections)									
Tuberculosis (010-019)	35,000	58	58	-50	100	100	25	75	100
(011 Pulmonary tuberculosis)									
(012 Other respiratory tuberculosis)									
(015 Tuberculosis of bones and joints)									
(019 Late effect of tuberculosis)									
Other Bacterial Diseases									
034 Streptococcal sore throat and scarlet fever	3,627,500	6,041	4,479	0	90	100	55	39	100
038 Septicemia	91,400	152	159	-10	100	100	65	35	100
Other (030-039)	132,400	220	220	0	100	100	39	41	100
(033 Whooping cough)									
(035 Erysipelas)									
(039 Other bacterial diseases)									
Poliomyelitis and Other Entrovirus Diseases of Central Nervous System (040-046)	5,500(a/)	9	9	-10	N/A	100	100	-	100
(045 Aseptic meningitis due to enterovirus)									
Viral Diseases Accompanied by Exanthem									
052 Chickenpox	2,834,600	4,720	4,860	-50	41	50	46	51	100
053 Herpes zoster	48,300	80	80	0	100	100	33	53	100
054 Herpes simplex	325,400	542	542	0	100	18	59	30	90
055 Measles	513,400	855	855	-50	77	75	40	25	95
056 Rubella	575,600	958	958	-50	83	43	60	36	98
057 Other viral exanthem	135,000	225	225	0	100	75	93	7	100

Note: Columns 4, 5, 7, and 10 represent the responses. Footnotes appear at the end of this Table.

TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
Arthopod-borne Viral Diseases (060-068)	8,700(a/)	14	14	-10	N/A	100	100	-	100
(068 Other arthropod-borne viral diseases)									
Other Viral Diseases									
070 Infectious hepatitis	8,400(a/)	14	14	-25	N/A	100	-	100	100
072 Mumps	411,200	685	685	-50	22	75	51	41	100
074 Specific diseases due to Coxsackie virus	45,600	76	76	0	100	100	100	-	100
075 Infectious mononucleosis	169,800	283	300	0	100	93	41	45	100
079 Other viral disease	11,038,800	18,382	19,250	0	50	50	38	28	80
Other (070-079)	54,300	90	90	0	100	95	-	-	95
(078 Other viral diseases of the conjunctiva)									
Rickettsioses and Other Arthropod-borne Diseases (080-089)	7,900(a/)	13	13	0	N/A	100	100		100
(082 Tick-borne rickettsioses)									
(084 Malaria)									
(087 Other trypanosomiasis)									
Syphilis and Other Venereal Diseases									
098 Gonococcal infections	120,900(b/)	201	837 A/	+28	N/A	100	-	87	98
Other (090-099)	1,800(b/)	3	18 A/	+25	N/A	100	-	30	98
(090 Congenital syphilis)									
(097 Other syphilis and not specified)									
(099 Other venereal disease)									
Other Spirochetal Diseases (100-104)	46,900	78	78	0	-	100	-	100	100
(100 Leptospirosis)									
(101 Vincent's angina)									

A/ based on ages 0-21

Note: Columns 4, 5, 7, and 10 represent the responses. Footnotes appear at the end of this Table.

TABLE 21

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	NIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
Mycoses									
110 Dermatophytosis	320,200	533	533	0	91	80	18	54	83
111 Dermatomycosis, other and specified	65,200	109	109	0	92	90	22	14	88
112 Moniliasis	234,700	391	400	0	100	90	47	37	100
Other (110-117)	3,500	6	6	0	100	100	58	26	100
(115 Histoplasmosis)									
(116 Blastomycosis)									
(117 Other systemic mycosis)									
Helminthiases (120-129)	184,600	307	307	0	100	100	18	61	80
(123 Other cestode infestation)									
(127 Other intestinal helminthiasis)									
(128 Other and unspecified helminthiasis)									
(129 Intestinal parasitism, unspecified)									
Other Infective and Parasitic Diseases									
133 Acariasis	140,700	234	234	0	100	100	26	37	78
Other (130-136)	94,000	157	179	-10	100	100	61	39	98
(131 Trichomoniasis urogenitalis)									
(132 Pediculosis)									
(136 Other and unspecified infective and parasitic diseases)									
II. Primary Cancer Sites(c/)									
Buccal Cavity and Pharnyx	500	1	1	N/A	N/A	100	N/A	N/A	100
Digestive System	900	1	1	N/A	N/A	100	N/A	N/A	100
Respiratory System	400	1	1	N/A	N/A	100	N/A	N/A	100

Note: Columns 4, 5, 7, and 10 represent the responses. Footnotes appear at the end of this Table.

TABLE 21

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
Female Genital System	800	1	1	N/A	N/A	100	N/A	N/A	100
Male Genital System	700	1	1	N/A	N/A	100	N/A	N/A	100
Urinary System	2,800	5	5	N/A	N/A	100	N/A	N/A	100
Melanoma of the Skin	300	1	1	N/A	N/A	100	N/A	N/A	100
Eye	1,400	2	2	N/A	N/A	100	N/A	N/A	100
Brain and Other Nervous System	6,400	10	10	N/A	N/A	100	N/A	N/A	100
Endocrine System	2,400	4	4	N/A	N/A	100	N/A	N/A	100
Bone and Connective Tissue	4,000	6	6	N/A	N/A	100	N/A	N/A	100
Lymphomas	4,300	7	7	N/A	N/A	100	N/A	N/A	100
Leukemia	6,100	10	10	N/A	N/A	100	N/A	N/A	100

Note: Columns 4, 5, 7, and 10 represent the responses. Footnotes appear at the end of this Table.

TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, .1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
III. Endocrine, Nutritional, and Metabolic Diseases (240-279)									
Diseases of Thyroid Gland	-	-	20	0	-	100	-	-	100
243 Cretinism of congenital origin	20,200	34	34	-8	100	100	23	63	100
244 Myxedema	7,300	12	12	0	100	100	-	24	100
Other (240-246)									
(240 Simple goiter)									
(241 Nontoxic nodular goiter)									
(245 Thyroiditis)									
Diseases of Other Endocrine Glands	63,300	105	105	+5	100	100	32	55	100
250 Diabetes mellitus	3,600	6	6	0	100	100	32	68	100
Other (250-258)									
(251 Disorders of pancreatic internal secretion other than diabetes mellitus)									
(252 Diseases of parathyroid gland)									
(253 Diseases of pituitary gland)									
(255 Diseases of adrenal glands)									
(256 Ovarian dysfunction)									
(257 Testicular dysfunction)									
(258 Polyglandar dysfunction and other diseases of endocrine glands)									
Avitaminoses and Other Nutritional Deficiency									
269 Other nutritional deficiency	110,800	185	185	-15	100	100	70	30	100
Other Metabolic Diseases									
270 Congenital disorders of amino-acid metabolism	5,300	9	9	0	100	100	-	-	100
273 Other and unspecified congenital disorders of metabolism	14,800	25	25	0	100	100	26	-	100
275 Plasma protein abnormalities	1,700	3	3	0	100	100	59	41	100
277 Obesity not specified as of endocrine origin	134,700(a/)	224	500	0	N/A	100	35	47	95

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
Other (270-279)	45,200	109	109	0	92	100	16	66	100
(271 Congenital disorders of carbohydrate metabolism)									
(272 Congenital disorders of lipid metabolism)									
(274 Gout)									
(278 Other hyperalimentation)									
IV. Diseases of the Blood and Blood-Forming Organs (280-289)									
280 Iron deficiency anemias	153,700	256	400	-25	99	100	16	76	100
282 Hereditary hemolytic anemias	34,500	58	58	0	100	100	56	2	100
289 Other diseases of blood and blood-forming organs	101,000	168	168	0	100	100	52	32	100
Other (280-289)	645,200	1,074	1,074	0	100	100	42	51	100
(281 Other deficiency anemias)									
(283 Acquired hemolytic anemias)									
(284 Aplastic anemia)									
(285 Other and unspecified anemias)									
(286 Coagulation defects)									
(287 Purpura and other hemorrhagic conditions)									
V. Mental Disorders (290-315)									
Psychoses (290-299)	5,400	9	18	5	100	100	-	29	100
(290 Senile and presenile dementia)									
(295 Schizophrenia)									
(296 Affective psychoses)									
Neuroses, Personality Disorders, and Other Nonpsychotic Mental Disorders									
300 Neuroses	98,400	164	328	10	100	100	18	21	90
301 Personality disorders	7,100(a/)	12	24	10	N/A	90	-	-	85
305 Physical disorders of presumably psychogenic origin	40,500	67	150	3	88	100	13	71	100
306 Special symptoms not elsewhere classified	177,000	295	2,000	0	74	100	40	19	100
308 Behavior disorders of childhood	111,500	186	350	11	96	90	40	16	95

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Other (300-309)	5,200	9	50	+15	80	100	8	25	85
(302 Sexual deviation)									
(303 Alcoholism)									
(304 Drug dependence)									
(307 Transient situational disturbances)									
Mental Retardation (310-315)	18,300(a/)	30	30	0	N/A	100	23	13	100
(313 Severe mental retardation)									
(315 Unspecified mental retardation)									
VI. Diseases of the Nervous System and Sense Organs (320-389)									
Inflammatory Diseases of Central Nervous System									
320 Meningitis	48,500	81	81	-10	100	100	100	-	100
Hereditary and Familial Diseases of Nervous System (330-333)	7,000	12	12	0	100	100	-	-	100
(330 Hereditary neuromuscular disorders)									
Other Diseases of Central Nervous System									
345 Epilepsy	176,100	293	293	0	99	100	40	35	100
346 Migraine	194,200	323	100	0	80	100	16	23	100
Other (340-349)	7,100	12	12	0	100	100	24	3	100
(342 Paralysis agitans)									
(343 Cerebral spastic infantile paralysis)									
(344 Other cerebral paralysis)									
(347 Other diseases of brain)									
(349 Other diseases of spinal cord)									
Diseases of Nerves and Peripheral Ganglia									
350 Facial paralysis	10,400(a/)	17	17	0	N/A	100	3	-	100

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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Inflammatory Diseases of the Eye									
360 Conjunctivitis and ophthalmia	47,100	78	153	0	89	100	46	29	100
364 Iritis	1,800	3	3	0	100	100	-	-	50
368 Inflammation of lacrimal glands and ducts	67,200	112	112	0	100	100	14	22	100
369 Other inflammatory diseases of eye	512,100	853	709**	0	100	100	11	43	84
378 Other diseases of eye	423,000	704			80		9	9	
Other Diseases and Conditions of Eye									
379 Blindness	2,100(a/)	3	3	0	N/A	100	-	-	50
Other (370-379)	263,400	439	439	0	80	100	-	-	78
(371 Corneal opacity)									
(374 Cataract)									
(377 Other diseases of retina and optic nerve)									
Diseases of the Ear and Mastoid Process									
380 Otitis externa	45,700	76			100		30	44	
381 Otitis media without mention of mastoiditis	7,917,400	13,184	18,000**	0	97	100	58	27	95 A/
384 Other inflammatory diseases of ear	2,310,100	3,847			70		31	31	
387 Other diseases of ear and mastoid process	1,055,700	1,758	1,758	0	99	100	26	40	100
389 Other deafness	37,400(a/)	62	62	0	N/A	100	-	-	100
Other (380-389)	5,400(a/)	9	9	0	N/A	100	28	30	100
(382 Otitis media with mastoiditis)									
(383 Mastoiditis without mention of otitis media									
(385 Meniere's disease)									
(386 Otosclerosis)									

A/ Modeling Panel, Child Care Panel 100%.

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VII. Diseases of the Circulatory System (390-458)									
Active Rheumatic Fever (390-392)	15,300	26	26	-25	100	100	28	67	100
(390 Rheumatic fever without mention of heart involvement)									
(391 Rheumatic fever with heart involvement)									
(392 Chorea)									
Chronic Rheumatic Heart Disease (393-398)	34,900	58	58	-20	100	100	29	72	100
(395 Diseases of aortic valve)									
(398 Other heart disease, specified as rheumatic)									
Hypertensive Disease									
401 Essential benign hypertension	36,000	60	60	0	97	100	9	68	100
Other (400-404)	4,000	7	7	10	75	100	-	-	100
(402 Hypertensive heart disease)									
Ischemic Heart Disease (410-414)	3,700	6	6	0	100	100	-	65	100
(410 Acute myocardial infarction)									
(412 Chronic ischemic heart disease)									
(413 Angina pectoris)									
Other forms of heart disease									
427 Symptomatic heart disease	483,700	805	200	0	99	100	58	15	100
Other (420-429)	46,300	77	77	0	98	100	28	41	100
(420 Acute pericarditis, nonrheumatic)									
(421 Acute and subacute endocarditis)									
(422 Acute myocarditis)									
(423 Chronic disease of pericardium, nonrheumatic)									
(424 Chronic disease of endocardium)									
(428 Other myocardial insufficiency)									

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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Diseases of Arteries, Arterioles, and Capillaries									
448 Diseases of capillaries	12,700(a/)	21	21	0	N/A	100	75	-	100
Diseases of Veins and Lymphatics, and Other Diseases of Circulatory System (450-458)	78,400	131	131	0	67	100	16	42	100
(451 Phlebitis and thrombophlebitis)									
(453 Other venous embolism and thrombosis)									
(454 Varicose veins of lower extremities)									
(455 Hemorrhoids)									
(456 Varicose veins of other sites)									
(457 Noninfective disease of lymphatic channels)									
(458 Other diseases of circulatory system)									
VIII. Diseases of the Respiratory System (460-519)									
Acute Respiratory Infection, Except Influenza									
460 Acute nasopharyngitis (common cold)	43,381,300	72,241	72,241	0	41	40	50	40	100
461 Acute sinusitis	890,800	1,483	1,483	0	58	60	45	46	100
462 Acute pharyngitis	10,959,200	18,250	23,500	0	47	50	56	36	100
463 Acute tonsillitis	3,050,500	5,080	9,000	0	90	100	43	47	100
464 Acute laryngitis and tracheitis	1,051,800	1,752	2,000	0	82	77.5	72	17	100
465 Acute upper respiratory infection of multiple or unspecified sites	2,724,700	4,537	4,537	0	48	50	43	50	100
466 Acute bronchitis and bronchiolitis	3,387,800	5,642	10,000	0	89	90	36	52	100
Influenza									
470 Influenza, unqualified	25,925,100	43,172	43,172	0	40	50	44	52	100
472 Influenza with other respiratory manifestations	1,165,000	1,940	1,940	0	64	75	-	100	100
Other (470-474)	2,651,100	4,415	4,415	0	29	50	18	83	100
(473 Influenza with digestive manifestations)									

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Pneumonia									
480 Viral pneumonia	47,000	78	78	0	100	100	100	-	100
483 Pneumonia due to other specified organism	48,500	81			-		100	-	
485 Bronchopneumonia, unspecified	49,000	82	2,069**	0	100	100	75	17	100
486 Pneumonia, unspecified	1,144,600	1,906			100		64	32	
Bronchitis, Emphysema, and Asthma									
490 Bronchitis, unqualified	1,700	3	4,424**	0	100	100	57	36	100
491 Chronic bronchitis	2,654,700	4,421			97		2	93	
493 Asthma	1,895,800	3,157	3,157	0	97	100	44	19	100
Other Diseases of Upper Respiratory Tract									
500 Hypertrophy of tonsils and adenoids	2,860,100	4,763	4,763	0	97	50	17	18	95
501 Peritonsillar abscess	4,800(a/)	8	8	0	N/A	100	78	-	100
502 Chronic pharyngitis and nasopharyngitis	26,900	45	45	0	85	100	50	34	100
503 Chronic sinusitis	1,755,100	2,923	2,923	0	69	75	42	33	100
507 Hay fever	2,095,600	3,490	5,000	0	77	75	32	22	100
508 Other diseases of upper respiratory tract	397,200	661	661	0	100	100	60	15	100
Other Diseases of Respiratory System									
512 Spontaneous pneumothorax	-	-			-		-	-	
519 Other diseases of respiratory system	383,800	639	1,500**	0	65	100	29	50	100
Other (510-519)	434,600	724			99		35	55	
(510 Empyema)									
(511 Pleurisy)									
(513 Abscess of lung)									
(514 Pulmonary congestion and hypostasis)									
(517 Other chronic interstitial pneumonia)									
(518 Bronchiectasis)									

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IX. Diseases of the Digestive System (520-577)									
Diseases of Oral Cavity, Salivary Glands, and Jaws									
520 Disorders of tooth development and eruption	1,327,500	2,211	2,211	0	80	20	77	19	40
528 Diseases of the oral soft tissues, excluding gingiva and tongue	200,400	334	334	0	77	25	42	49	50
Other (520-529)	1,432,400	2,382	2,382	0	53	75	35	53	33
(521 Diseases of hard tissues of teeth)									
(522 Diseases of pulp and periapical tissues)									
(523 Periodental diseases)									
(525 Other diseases and conditions of the teeth and supporting structures)									
(526 Diseases of the jaws)									
(527 Diseases of the salivary glands)									
(529 Diseases of the tongue and other oral conditions)									
Diseases of Esophagus, Stomach, and Duodenum									
535 Gastritis and duodenitis	68,800	115	115	0	86	100	25	68	100
536 Disorders of function of stomach	3,955,100	6,586	6,586	0	64	50	22	0	70
Other (530-537)	234,000	390	800	0	100	100	25	48	100
(530 Diseases of esophagus)									
(531 Ulcer of stomach)									
(532 Ulcer of duodenum)									
(533 Peptic ulcer, site unspecified)									
(537 Other diseases of stomach and duodenum)									
Appendicitis									
540 Acute appendicitis	143,400	239			100		27	23	
Other (540-543)	75,100(a/)	125	239**	0	N/A	100	18	52	100
(541 Appendicitis, unqualified)									
(543 Other diseases of appendix)									

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Hernia of Abdominal Cavity									
550 Inguinal hernia without mention of obstruction	3,600	6	100	0	100	100	18	10	100
Other (550-553)	203,200	338	400	0	99	25	28	24	100
(551 Other hernia of abdominal cavity without mention of obstruction)									
(553 Other hernia of abdominal cavity with obstruction)									
Other Diseases of Intestine and Peritoneum									
564 Functional disorders of intestines	592,000	986	986	0	81	75	40	39	100
565 Anal fissure and fistula	7,500(a/)	13	13	0	N/A	100	31	20	100
569 Other diseases of intestines and peritoneum	187,200	312	312	0	72	95	38	59	100
Other (560-569)	176,800	294	294	0	97	100	21	62	100
(560 Intestinal obstruction without mention of hernia)									
(561 Gastroenteritis and colitis, except ulcerative, of noninfectious origin)									
(563 Chronic enteritis and ulcertaive colitis)									
(566 Abscess of anal and rectal regions)									
(568 Peritoneal adhesions)									
Diseases of Liver, Gallbladder, and Pancreas (570-577)	25,300	42	42	0	100	100	14	59	100
(573 Other diseases of liver)									
(574 Cholelithiasis)									
(575 Cholecystitis and cholangitis, without mention of calculus)									
(576 Other diseases of gallbladder and biliary ducts)									

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X. Diseases of the Genitourinary System (580-629)									
Nephritis and Nephrosis									
Other (580-584)	5,600	9	1,100**	0	100	100	27	61	100
(581 Nephrotic syndrome)									
(583 Nephritis, unqualified)									
(584 Renal sclerosis, unqualified)									
Other Diseases of Urinary System									
590 Infections of kidney	493,200	821			100		27	58	
593 Other diseases of kidney and ureter	76,900	128			96		-	34	
595 Cystitis	720,900	1,201	1,201	0	100	100	22	57	100
597 Urethritis (nonvenereal)	33,100(a/)	55	55	0	N/A	100	49	17	100
598 Stricture of urethra	9,100	15	15	0	100	100	10	13	100
599 Other diseases of urinary tract	65,600	109	109	0	100	100	41	25	100
Other (590-599)	68,700	114	114	0	93	100	-	55	100
(591 Hydronephrosis)									
(594 Calculus of other parts of urinary system)									
(596 Other diseases of bladder)									
Diseases of Male Genital Organs (600-607)	48,500	81	150	0	100	100	20	31	100
(601 Prostatitis)									
(602 Other diseases of prostate)									
(603 Hydrocele)									
(604 Orchitis and epididymitis)									
(605 Redundant prepuce and phimosis)									
(607 Other diseases of male genital organs)									
Diseases of Breast, Ovary, Fallopian Tube, and Parametrium (610-616)	182,300(a/)	304	304	0	N/A	100	11	47	100
(610 Chronic cystic disease of breast)									
(611 Other diseases of breast)									
(616 Diseases of parametrium and pelvic peritoneum (female)									

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Diseases of Uterus and Other Female Genital Organs									
620 Infective diseases of cervix uteri	2,100	3	3	0	100	100	-	100	100
622 Infective diseases of uterus (except cervix), vagina and vulva	101,200	169	170	0	100	100	34	58	100
Other (620-629)	1,332,900	2,220	2,220	0	43	100	14	31	80 A/
(623 Uterovaginal prolapse)									
(626 Disorders of menstruation)									
(629 Other diseases of female genital organs)									
XI. Complications of Pregnancy, Childbirth and the Puerperium (630-678)									
XII. Diseases of the Skin and Subcutaneous Tissue (680-709)									
Infections of Skin and Subcutaneous Tissue									
680 Boil and carbuncle	142,000	236	236	0	65	90	48	44	100
681 Cellulitis of finger and toe	63,100	105	105	0	100	100	43	39	100
682 Other cellulitis and abscess	52,300	87	87	0	100	100	24	59	100
684 Impetigo	610,400	1,016	1,016	0	100	100	54	35	100
686 Other local infections of skin and subcutaneous tissue	455,600	759	759	0	100	100	42	25	100
Other (680-686)	249,000	415	415	0	100	100	28	52	100
(683 Acute lymphadenitis)									
(685 Pilonidal cyst)									
Other Inflammatory Conditions of Skin and Subcutaneous Tissue									
691 Infantile eczema and related conditions	27,600	46	46	0	100	100	22	9	100
692 Other eczema and dermatitis	2,228,600	3,711	3,711	0	92	100	35	43	100
696 Psoriasis and similar disorders	323,400	539	539	0	94	100	51	13	100
Other (690-698)	345,500	575	575	0	70	100	29	26	100
(690 Seborrheic dermatitis)									
(695 Erythematous conditions)									
(697 Lichen)									
(698 Pruritus and related conditions)									

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A/ Modeling Panel, Child Care Panel 100%.

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Other Diseases of Skin and Subcutaneous Tissue									
701 Other hypertropic and atropic conditions of skin	283,300	472	472	0	68	77.5	1	18	100
703 Diseases of nail	367,500	612	612	0	62	50	19	46	85
706 Diseases of sebaceous glands	1,321,500	2,201	2,201	0	60	70	7	13	100
708 Urticaria	1,700	3	380**	0	100	75	48	40	100
709 Other diseases of skin	226,200	377			84		27	5	
Other (700-709)	318,800	531	531	0	95	50	34	34	90
(700 Corns and callosities)									
(702 Other dermatoses)									
(704 Diseases of hair and hair follicles)									
(705 Diseases of sweat glands)									
(707 Chronic ulcer of skin)									
XIII. Diseases of the Musculoskeletal System and Connective Tissue (710-738)									
Arthritis and Rheumatism, except Rheumatic Fever									
712 Rheumatoid arthritis and allied conditions	12,600	21			100		34	31	
713 Osteoarthritis and allied conditions	5,400(a/)	9			N/A		-	67	
715 Arthritis, unspecified	115,200	192	490**	0	92	100	-	36	100
717 Other nonarticular rheumatism	156,400(a/)	260			N/A		33	52	
Other (710-718)	5,100	9			80		100	-	
(714 Other specified forms of arthritis)									
Osteomyelitis and Other Diseases of Bone and Joint									
723 Other diseases of bone	44,900	75	75	0	100	100	-	25	100
Other (720-729)	402,500	670	670	0	43	100	56	24	100
(722 Osteochondrosis)									
(724 Internal derangement of joint)									
(725 Displacement of intervertebral disc)									
(728 Vertebrogenic pain syndrome)									
(729 Other diseases of joint)									

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** Conditions within brackets were grouped and responded to as one condition.

TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

1	2	3	4	5	6	7	8	9	10
ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
Other Diseases of Musculoskeletal System									
731 Synovitis, bursitis, and tenosynovitis	121,500	202	202	0	58	75	18	34	100
738 Other deformities	155,700(a/)	259	259	0	N/A	100	8	1	100
Other (730-738)	48,300	80	80	0	-	100	15	10	100
(732 Infective myositis and other inflammatory diseases of tendon and fascia)									
(733 Other diseases of muscle, tendon, and fascia)									
(734 Diffuse diseases of connective tissue)									
(735 Curvature of spine)									
(736 Flat foot)									
(737 Hallux valgus and varus)									
XIV. Congenital Anomalies (740-759)									
741 Spina bifida	-	-	100	0	-	100	-	-	100
743 Other congenital anomalies of nervous system	3,600	6	6	0	100	100	51	-	100
746 Congenital anomalies of heart	385,800	642	15	0	98	100	76	19	100
747 Other congenital anomalies of circulatory system	9,000	15	15	0	100	100	44	-	100
750 Other congenital anomalies of upper alimentary tract	11,000	18	18	0	100	100	62	13	100
752 Congenital anomalies of genital organs	5,300	9	9	0	100	100	17	13	100
753 Congenital anomalies of urinary system	18,000	30	30	0	100	100	100	-	100
754 Clubfoot (congenital)	46,900(a/)	78	78	0	N/A	100	7	3	100
755 Other congenital anomalies of limbs	188,500(a/)	314	314	0	N/A	100	14	9	100
757 Congenital anomalies of skin, hair, and nails	14,400	24	24	0	100	100	11	39	100
759 Congenital syndromes affecting multiple systems	8,800	15	265	0	100	100	67	13	100
Other (740-759)	44,700	74	74	0	100	100	15	6	100
(742 Congenital hydrocephalus)									

Continued on next page

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GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
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(744 Congenital anomalies of eye)									
(748 Congenital anomalies of respiratory system)									
(749 Cleft palate and cleft lip)									
(751 Other congenital anomalies of digestive system)									
(756 Other congenital anomalies of musculoskeletal system)									
(758 Other and unspecied congenital anomalies)									
XV. Certain Causes of Perinatal Morbidity and Mortality (760-779)									
775 Hemolytic disease of newborn without mention of kernicterus	1,800	3	5	0	100	100	-	-	100
777 Immaturity, unqualified	-	-	500	0	-	100	-	-	100
778 Other conditions of fetus or newborn	252,500	421	421	0	100	100	76	24	100
Other (760-779)	3,400(a/)	6	6	0	N/A	100	100	-	100
(762 Toxemia of pregnancy)									
(768 Difficult labor with other and unspecified complications)									
(769 Other complications of pregnancy and childbirth)									
(771 Conditions of umbilical cord)									
(772 Birth injury without mention of cause)									
(774 Hemolytic disease of newborn with kernicterus)									

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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XVI. Symptoms and Ill-Defined Conditions (780-796)									
Symptoms Referable to Systems or Organs									
780 Certain symptoms referable to nervous system and special senses	133,000	222	220	0	70	100	48	18	100
781 Other symptoms referable to nervous system and special senses	1,700	3	3	0	-	100	24	6	100
782 Symptom referable to cardiovascular and lymphatic system	528,200	880	880	0	82	85	42	46	100
783 Symptom referable to respiratory system	1,182,900	1,970	1,970	0	69	95	43	26	100
784 Symptom referable to upper gastrointestinal tract	89,500(a/)	149	149	0	N/A	50	42	57	100
785 Symptom referable to abdomen and lower gastrointestinal tract	2,470,000	4,113	4,113	0	27	50	46	44	100
786 Symptom referable to genitourinary system	105,600(a/)	176	176	0	N/A	100	31	16	100
787 Symptoms referable to limbs and joints	400,700	667	667	0	88	50	40	31	50
788 Other general symptoms	5,052,600	8,414	8,414	0	49	75	44	41	100
Other (780-789) (789 Abnormal urinary constituents of unspecified cause)	3,400	6	6	0	100	100	18	24	100
Senility and Ill-Defined Diseases									
790 Nervousness and debility	299,000	498	498	0	1	50	40	23	100
791 Headache	2,044,800	3,405	3,405	0	16	25	15	70	100
793 Observation, without need for further medical care	744,600(a/)	1,240	1,240	0	N/A	100	54	14	100
796 Other ill-defined and unknown causes of morbidity and mortality	252,200	420	420	0	63	100	40	40	100

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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XVII. Accidents, Poisonings, and Violence (Nature of Injury) (800-999)									
Fracture of Skull, Spine, and Trunk									
803 Other and unqualified skull fractures	87,600	162	162	0	100	100	-	91	100
Other (800-809)	182,700	304	304	0	75	100	12	7	100
(801 Fracture of base of skull)									
(802 Fracture of face bones)									
(805 Fracture and fracture dislocation of vertebral column without mention spinal cord lesion)									
(807 Fracture rib(s), sternum, and larynx)									
Fracture of Upper Limb									
810 Fracture of clavicle	184,500	307	307	0	100	100	27	41	100
813 Fracture of radius and ulna	138,600	231	231	0	100	100	13	32	75
814 Fracture of carpal bone(s)	228,500	381	381	0	100	100	4	42	75
816 Fracture of one or more phalanges of hand	702,700	1,170	1,170	0	100	100	21	33	75
Other (810-819)	163,600	272	272	0	100	100	11	31	25
(811 Fracture of scapula)									
(812 Fracture of humerus)									
(815 Fracture of metacarpal bone(s))									
(817 Multiple fractures of hand bones)									
(818 Other, multiple, and ill-defined fractures of upper limb)									
Fracture of Lower Limb									
Other (820-829)	450,500	750	750	0	100	100	12	21	25
(820 Fracture of neck of femur)									
(822 Fracture of patella)									
(823 Fracture of tibia and fibula)									
(824 Fracture of ankle)									

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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(825 Fracture of one or more tarsal and metatarsal bones)									
(826 Fracture of one or more phalanges of foot)									
(827 Other, multiple, and ill-defined fractures of lower limb)									
Dislocation Without Fracture (830-839)	90,500	151	151	0	100	100	45	26	50
(830 Dislocation of jaw)									
(831 Dislocation of shoulder)									
(832 Dislocation of elbow)									
(833 Dislocation of wrist)									
(834 Dislocation of finger)									
(835 Dislocation of hip)									
(836 Dislocation of knee)									
(839 Other, multiple, and ill-defined dislocations)									
Sprains and Strains of Joints and Adjacent Muscles									
845 Sprains and strains of ankle and foot	1,577,400	2,627	2,647	0	70	70	24	31	75
847 Sprains and strains of other and unspecified parts of back	542,700	904	904	0	90	80	18	45	75
Other (840-848)	1,595,100	2,656	2,656	0	70	80	12	54	75
(840 Sprains and strains of shoulder and upper arm)									
(841 Sprains and strains of elbow and forearm)									
(842 Sprains and strains of wrist and hand)									
(843 Sprains and strains of hip and thigh)									
(844 Sprains and strains of knee and leg)									
(846 Sprains and strains of sacroiliac region)									
(848 Other and ill-defined sprains and strains)									

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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Intracranial Injury (excluding those with skull fracture)									
850 Concussion	410,800	684	684	0	89	100	44	43	100
851 Cerebral laceration and contusion	5,700(a/)	9			N/A		-	74	
854 Intracranial injury of other and unspecified nature	244,500	407	416**	0	83	100	61	29	100
Laceration and Open Wound of Head, Neck, and Trunk									
870 Open wound of eye and orbit	229,900	383	383	0	72	100	21	63	20
873 Other and unspecified laceration of head	4,117,300	6,856	6,856	0	89	100	34	46	70 A/
Other (870-879)	143,000	238	238	0	100	100	17	60	50
(871 Enucleation of eye)									
(872 Open wound of ear)									
(874 Open wound of neck)									
(875 Open wound of chest (wall)									
(876 Open wound of back)									
(877 Open wound of buttock)									
(878 Open wound of genital organs (external) including traumatic amputation)									
(879 Other, multiple, and unspecified open wounds of head, neck, and, trunk)									
Laceration and Open Wound of Upper Limb									
883 Open wound of finger(s)	1,314,000	2,188	2,188	0	93	100	37	46	60
Other (880-887)	1,262,800	2,103	2,103	0	96	100	14	72	20
(880 Open wound of shoulder and upper arm)									
(881 Open wound of elbow, forearm, and wrist)									
(882 Open wound of hand except finger(s) alone)									
(884 Multiple and unspecified open wound of upper limb)									

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A/ Modeling Panel, Child Care Panel 90%.

** Conditions within brackets were grouped and responded to as one condition.

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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ICDA & Diagnosis(1/)	Incidence/ Prevalence 0-16, 1977(2/)	1977 Rate per 100,000(3/)	1977 Adjusted Rate per 100,000	% Rate Change 1977 to 1990	HIS % Seeing Physician(4/)	% Requiring Health Care in 1990	NAMCS % Handled by Pediatrician (5/6/)	NAMCS % Handled by GP/FP(5/6/)	% Requiring Health Care That Should be Seen by General Child Care Provider in 1990
(885 Traumatic amputation of thumb (complete) (partial))									
(886 Traumatic amputation of other finger(s) (complete))									
(887 Traumatic amputation of arm and hand (complete) (partial))									
Laceration and Open Wound of Lower Limb (890-897)	2,648,000	4,410	4,410	0	95	100	17	66	25
(890 Open wound of hip and thigh)									
(891 Open wound of knee, leg (except thigh), and ankle)									
(892 Open wound of foot, except toe(s) alone)									
(893 Open wound of toe(s))									
(894 Multiple and unspecified open wound of lower limb)									
(895 Traumatic amputation of toe(s) (complete) (partial))									
(896 Traumatic amputation of foot (complete) (partial))									
(897 Traumatic amputation of leg(s) (complete) (partial))									
Laceration and Open Wound of Multiple Location									
907 Multiple open wounds of other and unspecified location	189,700	316	316	0	N/A	100	28	35	28
Superficial Injury									
910 Superficial injury of face, neck, and scalp	511,800	852	3,400**	0	73	75 A/	36	32	90
Other (910-918)	1,539,100	2,563			73		33	49	
(911 Superficial injury of trunk)									
(912 Superficial injury of shoulder and upper arm)									

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A/ Modeling Panel, Child Care Panel 80%.

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GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES
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[(913 Superficial injury of elbow, forearm, and wrist) (914 Superficial injury of hand(s), except finger(s) alone) (915 Superficial injury of finger(s)) (916 Superficial injury of hip, thigh, leg, and ankle) (917 Superficial injury of foot and toe(s)) (918 Superficial injury of other, multiple, and unspecified sites)]									
Contusion and Crusing with Intact Skin Surface									
[920 Contusion of face, scalp, and neck except eye(s)	709,400	1,181			100		25	58	
927 Contusion of hip, thigh, leg, and ankle	1,099,000	1,830	7,000**	0	61	68	22	37	100
Other (920-929)	2,346,200	3,907			84		28	48	
(921 Contusion of eye and orbit) (922 Contusion of trunk) (923 Contusion of shoulder and upper arm) (924 Contusion of elbow, forearm, and wrist) (925 Contusion of hand(s), except finger(s) alone) (926 Contusion of finger(s)) (928 Contusion of foot and toe(s)) (929 Contusion of other, multiple, and unspecified sites)]									
Effect of Foreign Body, Entering Through Orifice									
930 Foreign body in eye and adnexa	158,500	264	264	0	100	100	6	28	50
Other (930-939)	333,900	556	556	0	82	100	15	19	90
(931 Foreign body in ear)									

Continued on next page

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(932 Foreign body in nose)									
(933 Foreign body in pharynx and larynx)									
(935 Foreign body in mouth, esophagus, and stomach)									
(936 Foreign body in intestine and colon)									
(938 Foreign body in digestive system, unspecified)									
(939 Foreign body in genitourinary tract)									
Burn (940-949)	639,300	1,065	1,065	0	76	90	27	43	80
(940 Burn confined to eye)									
(941 Burn confined to face, head, and neck)									
(942 Burn confined to trunk)									
(943 Burn confined to upper limb except wrist and hand)									
(944 Burn confined to wrist(s) and hand(s))									
(945 Burn confined to lower limb(s))									
(946 Burn involving face, head, neck, with limb(s))									
(947 Burn involving trunk with limb(s))									
(948 Burn involving face, head, and neck, with trunk and limb(s))									
(949 Burn involving other and unspecified parts)									
Injury to Nerves and Spinal Cord (950-959)	1,900	3	3	0	100	100	35	30	50
(952 Injury to nerve(s) in upper arm)									
(954 Injury to nerve(s) in wrist and hand)									
(956 Injury to nerve(s) in lower leg)									
(957 Injury to nerve(s) in ankle and foot)									
(958 Spinal cord lesion without evidence of spinal bone injury)									
(959 Other nerve injury including nerve injury in several parts)									

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Adverse Effect of Medicinal Agents									
965 Adverse effect of analgesics and antipyretics	12,000(a/)	20	1,700**	0	N/A	100	-	31	100
Other (960-979)	400,700	667			100		23	70	
(960 Adverse effect of antibiotics)									
(961 Adverse effect of other anti-infectives)									
(962 Adverse effect of hormones and synthetic substitutes)									
(969 Adverse effect of local anesthetics)									
(977 Adverse effect of other and unspecied drugs)									
(979 Alcohol in combination with specified medicinal agents)									
Toxic Effect of Substances Chiefly Nonmedicinal as to Source									
981 Toxic effect of petroleum products	-	-			-		-	-	
982 Toxic effect of industrial solvents	-	-			-		-	-	
983 Toxic effect of corrosive aromatics, acids, and caustic alkalis	1,700	3			100		-	-	
989 Toxic effect of other substances chiefly nonmedicinal as to source	593,700	989			100		41	40	
Other (980-989)	48,700	81	81	0	6	100	-	100	100
(984 Toxic effect of lead and its compounds (including fumes)									
(987 Toxic effect of other gases, fumes, or vapors)									
Other Adverse Effects									
992 Effects of heat	182,100	303	303	0	77	100	100	-	100
996 Injury, other and unspecified	776,400	1,293	1,293	0	88	90	27	50	80
999 Other complications of medical care	908,500	1,513	1,513	0	84	100	-	-	100
Other (990-999)	124,300	207	207	0	100	100	20	-	50
(991 Effects of reduced temperature and excessive dampness)									

(Continued on next page)

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TABLE 23

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON PREVALENCE RATES AND PHYSICIAN SHARES

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Needs for Pediatrics)

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Special Conditions and Examinations Without Sickness (Y00-Y13)									
Y00.5 Well baby and child care	44,603,000(d/) 30,225,000(d/)	73,276(d/) 50,332(d/)	100,000	N/A	N/A	100	76	21	100
Y06 Prenatal care	249,800(a/)	416	416	+8	N/A	100	11	35	100
Y09 Other person without complaint or illness	126,200(a/)	210	210	0	N/A	100	25	51	78
Y10 Medical and surgical after care	773,400(a/)	1,288	1,288	0	N/A	100	13	21	75
Other	149,200(a/)	248	248	0	N/A	100	14	51	75
(Y01 Skin immunity and sensitization tests)									
(Y03 Follow-up examination with no need for further care or need for only limited care)									
(Y04 Contacts with infective and parasitic diseases)									
(Y07 Postpartum observation)									
(Y13 Social maladjustment without manifest psychiatric disorder)									

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Footnotes to Table 23

(1/) Morbidity information as given in this table is based on the International Classification of Diseases, adapted for use in the United States (ICDA), which in turn is based on the Eighth Revision of the International Classification of Diseases (ICD). While the detailed list of 3-digit ICDA categories consists of a list of 671 categories of diseases and morbidity conditions, the list as given in this table has been significantly reduced. Each of the following conditions was sufficient for a 3-digit code to be included in the table as a separate "cell":

a) the code contained at least one-tenth of one percent of either the General and Family Practitioners' or Pediatricians' visit workload as determined by the National Ambulatory Medical Care Survey (NAMCS);

b) the Yale-Schonfeld study included norms of care for the code or for a morbidity component within the 3-digit code; and

c) the USC-Mendenhall pediatrics study included a percentage referral to medical specialists for the code in its ambulatory encounters section.

Each of the following conditions was sufficient for a 3-digit code to be included in the residual broad section headings of the code, listed as "other":

a) the code contained more than zero but less than one-tenth of one percent of General and Family Practitioners' or Pediatricians' visit workload as determined by NAMCS; and

b) the USC Mendenhall pediatrics study contained data on norms of care for the code in its ambulatory encounters section.

ICDA codes at the 3-digit level not meeting the conditions described above have not been included in this table, and were not separately considered by the panel. However, the panel was free to add any conditions to the list that it thought would increase in importance in 1990, from a manpower standpoint.

(2/) Unless otherwise noted, the incidence-prevalence data contained in this table refer to U.S. population ages 0-16 and have been derived from special unpublished data tabulations of the National Center for Health Statistics' Health Interview Surveys of 1977 and previous years. Data on incidences of acute conditions at the 3-digit ICDA level were taken from special tabulations of the 1977 Health Interview Survey covering the U.S. civilian noninstitutional population and conform to data aggregates as published in the NCHS

series on Acute Conditions: Incidence and Associated Disability. (Vital and Health Statistics, Series 10, DHEW Publication No.(PHS)78-1553). To these estimates have been added data on prevalences of chronic conditions at the 3-digit ICDA level taken from special tabulations of previous Health Interview Surveys. Data on prevalences of chronic conditions conform to data aggregates as published in NCHS series on Prevalence of Chronic Skin and Musculoskeletal Conditions, 1976; Prevalence of Selected Chronic Digestive Conditions, 1975; Prevalence of Chronic Conditions of the Genitourinary, Nervous, Endocrine, Metabolic, and Blood and Blood-Forming Systems and other Selected Chronic Conditions, 1973; Prevalence of Chronic Circulatory Conditions, 1972; and Prevalence of Selected Chronic Respiratory Conditions, 1970. (Vital and Health Statistics, Series 10, DHEW Publications). The prevalences of chronic conditions have been extrapolated to 1977 based on the changes in the U.S. population ages 0-16 between each respective survey year and 1977, using population estimates derived from the Bureau of the Census (Estimates of the Population of the United States by Age, Sex, and Race: 1970 to 1977. Current Population Reports, Series P-25, No. 721, April 1978).

(3/) The incidence-prevalence estimates for the U.S. population ages 0-16 are presented in this column as rates per 100,000 population, ages 0-16. The population base used in the calculations was taken from the Bureau of Census' Current Population Reports cited previously.

(4/) These data are derived from special tabulations of the Health Interview Surveys which contain the number of acute incidences and prevalences of chronic conditions which resulted in a visit to a physician.

(5/ 6/) The data contained in this table have been derived from special tabulations of the National Center for Health Statistics' National Ambulatory Medical Care Survey (NAMCS). The data cover the two year period 1975-76, and include the share of total ambulatory visits accruing to the office-based general and family practitioner and the pediatrician. It should be noted that while shares of visits by ICDA classification for the pediatric cardiologist and pediatric allergist are excluded from these data, shares accruing to the other pediatric subspecialists may be implicitly included in the pediatrician shares.

(a/) These data have been derived from special tabulations of the National Ambulatory Medical Care Survey (NAMCS). These survey tabulations cover the two-year period 1975-76, and include weighted numbers of "new" visits per ICDA condition. These numbers have been annualized and extrapolated to 1977. While

used as proxies for incidence-prevalence data, it should be noted that these figures are not true "incidence-prevalence" figures for the following reasons:

1) Unlike morbidity data in the Health Interview Survey, the NAMCS data may be thought of as morbidities that resulted in a visit to a physician.

2) The number of new visits from NAMCS theoretically undercounts the prevalence of chronic conditions the onset of which occurred prior to the NAMCS survey year.

It should also be noted that any figure taken from the special NAMCS tabulations with less than 100,000 visits has a relative standard error of at least 45 percent. Therefore, visits significantly less than 100,000 - most of the visits used in this table as taken from NAMCS - should be interpreted with extreme caution. For example, the 5,500 visits for ICDA 045-aseptic meningitis due to enterovirus - is the result of one visit surveyed by NAMCS within the 1975-76 period.

(b/) Prevalence calculations for venereal diseases are based on 1975 age-adjusted rates provided by the Center for Disease Control of the Public Health Service, DHEW.

(c/) Cancer incidence data were taken from the Third National Cancer Survey conducted during 1969-1971 in seven metropolitan areas and two entire States. These sites (Detroit SMSA, Pittsburgh SMSA, Atlanta SMSA, Birmingham SMSA, Dallas-Fort Worth SMSA, State of Iowa, Minneapolis-St. Paul SMSA, State of Colorado and San Francisco-Oakland SMSA) were not selected in accordance with the principles of probability sampling and therefore are not representative of the entire United States population. However, they did represent slightly over 10 percent of the population of the U.S. and were selected so that the proportionate distribution of their population among the Northern, Southern, and Western regions of the United States was the same as that of the entire population.

Tumor site and histology data were collected for malignancies according to primary site. Cancer in site and benign tumors were excluded. A cancer patient could be counted more than once, if he/she had cancer in several primary sites. Coding did not conform to the ICDA, but rather to the Manual of Tumor Nomenclature and Coding, 1968 Edition, New York, American Cancer Society Inc., 1968. In order to capture all cases of cancer within a site, information from hospital charts, pathology reports, autopsy reports, death certificates, radio-therapy records, outpatient clinic records, cancer registeries and medical record indexes were

abstracted. Adjustments were made for age distribution differences between the U.S. population and site estimates in order to calculate rates applicable to the entire population.

Methodology for Converting Cancer Incidence Rates to Prevalence Rates

For each primary cancer site diagnosis, the 1969-71 average age-specific incidence rates (A/) for white and black children 0-16 years old per 100,000 population were applied to the projected age-specific population for 1985 through 1990, disaggregated for white and black children to obtain incidence figures for 1985 through 1990.

The 1967-73 age-specific five-year observed survival rate (B/) by race for each primary cancer site diagnosis was linearly interpolated to obtain the survival rate for each year of the five-year period. The formula used for the linear interpolation is as follows:

$$100\text{-}n\ \left(\frac{100\text{-}5\text{-year survival rate}}{5}\right)$$

whereas n=1, 2, 3, 4 and 5.

The age-specific interpolated survival rates of the white and black population for each of the five years were applied to the age-specific incidence figures as follows:

1) Fifth-year interpolated age-specific survival rates of the white and black 0-16 population applied to the 1985 corresponding age-specific incidence figures for white and black children.

2) Fourth-year interpolated age-specific survival rates of the white and black 0-16 population applied to the 1986 corresponding age-specific incidence figures for white and black children.

3) Third-year interpolated age-specific survival rates of the white and black 0-16 population applied to the 1987 corresponding age-specific incidence figures for white and black children.

4) Second-year interpolated age-specific survival rates of the white and black 0-16 population applied to the 1988 corresponding age-specific incidence figures for white and black children.

5) First-year interpolated age-specific survival rates of the white and black 0-16 population applied to the 1989 corresponding age-specific incidence figures for white and black children.

The 1990 population figures for the primary cancer site diagnoses were calculated by summation of the results of Step 1 through Step 5 and the 1990 incidence figures. These steps were performed separately for males and females prior to the summation of the results.

For several cancer sites, five-year survival rates were not available for each sex, age, and race cohort. Thus, interpolations were used to calculate missing rates. For example, if 1970-1973 rates of black female children for a certain condition were missing, the average change in the rate for white female children of the same age group between 1965-1969 and 1970-1973 was applied to the available 1965-1969 rate of black female children within the same age group.

(A/) Taken from Tables 20F and 21F, Third National Cancer Survey: Incidence Data. Monograph 41. DHEW Publication No. (NIH) 75-787, 1975.

(B/) Rates taken from Tables E of the primary site in Cancer Patient Survival. Report #5. DHEW Publication No. (NIH)77-992, 1976.

(d/) These figures do not correspond to incidence and prevalence, but rather to the total number of preventive care visits required for preventive care for children 0-16, as recommended by the American Academy of Pediatrics (AAP) and Breslow-Somers. The first figure corresponds to AAP recommendations and the second to Breslow/Somers. These figures were derived from 1976 population estimates and not 1977 estimates as were other calculations in column 2 of Table 1A. Calculations were derived for 0-14 ages by dividing the total population of a specific age grouping by the number of years included in the age group and multiplying this figure by the recommended number of visits. For children 15-16, a ratio of their population estimates to the total number of children in their age group (for Breslow-Somers) was multiplied by the total visit recommendations calculated for the entire age group, using the method described above. Projecting estimates for 1990 yields requirements for 54,488,000 visits by the AAP and 33,425,000 by Breslow-Somers, which equals a population rate change per 100,000 of 7 percent for AAP and 4 percent for Breslow-Somers.

Sources the data are taken from include the following:

Task Force on Pediatric Education, The Future of Pediatric Education, 1978, p. 61. This presents figures derived from American Academy of Pediatrics, Standards of Child Health Care, Chapter 2, Evanston, Illinois, 1977.

Breslow, L. and Somers, A.R. "The Lifetime Health Monitoring Program." New England Journal of Medicine 296:601-608, May 1977.

TABLE 24

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON NORMS OF CARE AND DELEGATION

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
I. Infective and Parasitic Diseases (000-136)		1.6				
Intestinal Infectious Diseases						
008 Enteritis due to other specified organism	1.2		1.2*	1.1	1.2	43
009 Diarrheal diseases	1.3		-	1.3	1.3	50
Other (000-009)	1.0		-	-	1.2	23
(003 Other Salmonella infections)						
Tuberculosis (010-019)	1.0		-	-	1.5	0
(011 Pulmonary tuberculosis)						
(012 Other respiratory tuberculosis)						
(015 Tuberculosis of bones and joints)						
(019 Late effect of tuberculosis)						
Other Bacterial Diseases						
034 Streptococcal sore throat and scarlet fever	1.7		1.6	1.5	1.9	50
038 Septicemia	2.8		-	1.9	2.8	0
Other (030-039)	1.3		-	-	2.0	10
(033 Whooping cough)						
(035 Erysipelas)						
(039 Other bacterial diseases)						
Poliomyelitis and Other Entrovirus Diseases of Central Nervous System (040-046)	1.0		-	-	2.3	0
(045 Aseptic meningitis due to enterovirus)						

B/ This column is the result of the Child Medical Care Delphi Panel. The sum of delegated visits for approximately 230 morbidity conditions amounted to 28.8 percent of all visits. GMENAC endorsed a 15 percent delegation rate for the aggregate of morbidity conditions accruing to the Child Medical Care specialty, based on the projected supply of nonphysician child heath care providers. However, rates of delegation vary significantly by morbidity.

Note: Columns 6 and 7 represent the responses. Footnotes appear at the end of Table 24. See footnote 3/ for explanation of asterisk.

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Viral Diseases Accompanied by Exanthem						
052 Chickenpox	1.0		1.6	1.0	1.0	50
053 Herpes zoster	1.7		1.0	1.0	1.6	23
054 Herpes simplex	1.3		1.1	1.2	1.0	50
055 Measles	1.4		1.9	2.2	1.4	50
056 Rubella	1.1		1.0	1.6	1.1	33
057 Other viral exanthem	1.2		-	1.2	1.1	40
Arthopod-borne Viral Diseases (060-068) (068 Other arthropod-borne viral diseases)	1.0		-	-	1.4	0
Other Viral Diseases						
070 Infectious hepatitis	1.9		12.3	1.0	4.1	3
072 Mumps	1.0		1.4	1.0	1.1	25
074 Specific diseases due to Coxsackie virus	1.3		1.3*	1.2	1.3	20
075 Infectious mononucleosis	3.4		3.4	1.9	3.0	25
079 Other viral disease	1.7		1.5*	1.3	1.5	30
Other (070-079) (078 Other viral diseases of the conjunctiva)	1.0		-	-	1.0	10
Rickettsioses and Other Arthropod-borne Diseases (080-089) (082 Tick-borne rickettsioses) (084 Malaria) (087 Other trypanosomiasis)	1.0		-	-	2.0	0

B/ This column is the result of the Child Medical Care Delphi Panel. The sum of delegated visits for approximately 230 morbidity conditions amounted to 28.8 percent of all visits. GMENAC endorsed a 15 percent delegation rate for the aggregate of morbidity conditions accruing to the Child Medical Care specialty, based on the projected supply of nonphysician child heath care providers. However, rates of delegation vary significantly by morbidity.

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Henden-hall(4/)		
Syphilis and Other Venereal Diseases						
098 Gonococcal infections	1.0		-	2.0	2.0	50
Other (090-099)	35.4		-	-	2.7	15
(090 Congenital syphilis)						
(097 Other syphilis and not specified)						
(099 Other venereal disease)						
Other Spirochetal Diseases (100-104)	10.7		-	-	4.0	5
(100 Leptospirosis)						
(101 Vincent's angina)						
Mycoses						
110 Dermatophytosis	1.1		1.1	1.3	1.4	28
111 Dermatomycosis, other and specified	1.1		1.1	5.0	1.6	25
112 Moniliasis	1.4		1.9	1.1	1.5	33
Other (110-117)	4.2		-	-	4.0	7.5
(115 Histoplasmosis)						
(116 Blastomycosis)						
(117 Other systemic mycosis)						
Helminthiases (120-129)	1.1		-	-	1.4	50
(123 Other cestode infestation)						
(127 Other intestinal helminthiasis)						
(128 Other and unspecified helminthiasis)						
(129 Intestinal parasitism, unspecified)						
Other Infective and Parasitic Diseases						
133 Acariasis	1.2		-	1.2	1.3	50

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ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Other (130-136)	1.3		-	-	1.4	45
(131 Trichomoniasis urogenitalis)						
(132 Pediculosis)						
(136 Other and unspecified infective and parasitic diseases)						
II. Primary Cancer Sites						
Buccal Cavity and Pharnyx	N/A	N/A	N/A	N/A	2.0	0
Digestive System	N/A	N/A	N/A	N/A	2.0	0
Respiratory System	N/A	N/A	N/A	N/A	2.0	0
Female Genital System	N/A	N/A	N/A	N/A	2.0	0
Male Genital System	N/A	N/A	N/A	N/A	2.0	0
Urinary System	N/A	N/A	N/A	N/A	2.0	0
Melanoma of the Skin	N/A	N/A	N/A	N/A	1.5	0
Eye	N/A	N/A	N/A	N/A	1.2	0
Brain and Other Nervous System	N/A	N/A	N/A	N/A	2.0	0
Endocrine System	N/A	N/A	N/A	N/A	2.0	0

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ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Bone and Connective Tissue	N/A	N/A	N/A	N/A	2.0	0
Lymphomas	N/A	N/A	N/A	N/A	2.0	0
Leukemia	N/A	N/A	N/A	N/A	2.1	0
III. Endocrine, Nutritional, and Metabolic Diseases (240-279)		2.6				
Diseases of Thyroid Gland						
243 Cretinism of congenital origin	-		2.8	-	1.8	10
244 Myxedema	6.8		7.0	5.0	4.5	0
Other (240-246)	2.7		-	-	3.0	25
(240 Simple goiter)						
(241 Nontoxic nodular goiter)						
(245 Thyroiditis)						
Diseases of Other Endocrine Glands						
250 Diabetes mellitus	8.9		3.0	6.1	4.5	25
Other (250-258)	1.5		-	-	2.0	0
(251 Disorders of pancreatic internal secretion other than diabetes mellitus)						
(252 Diseases of parathyroid gland)						
(253 Diseases of pituitary gland)						
(255 Diseases of adrenal glands)						
(256 Ovarian dysfunction)						
(257 Testicular dysfunction)						
(258 Polyglandar dysfunction and other diseases of endocrine glands)						

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ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Avitaminoses & Other Nutritional Deficiency						
269 Other nutritional deficiency	2.9		-	1.2	2.8	38
Other Metabolic Diseases						
270 Congenital disorders of amino-acid metabolism	-		-	1.0	2.0	0
273 Other and unspecified congenital disorders of metabolism	1.6		3.1*	10.6	6.0	0
275 Plasma protein abnormalities	-		-	2.0	3.3	0
277 Obesity not specified as of endocrine origin	2.5		-	2.9	4.5	50
Other (270-279)	2.9		-	-	3.0	5
(271 Congenital disorders of carbohydrate metabolism)						
(272 Congenital disorders of lipid metabolism)						
(274 Gout)						
(278 Other hyperalimentation)						
IV. Diseases of the Blood and Blood-Forming Organs (280-289)		1.4				
280 Iron deficiency anemias	5.2		4.7	1.6	3.0	43
282 Hereditary hemolytic anemias	6.8		-	1.5	5.3	4
289 Other diseases of blood and blood-forming organs	1.3		-	1.6	2.0	0
Other (280-289)	1.9		-	-	3.0	0
(281 Other deficiency anemias)						
(283 Acquired hemolytic anemias)						

continued on next page

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ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
(284 Aplastic anemia)						
(285 Other and unspecified anemias)						
(286 Coagulation defects)						
(287 Purpura and other hemorrhagic conditions)						
V. Mental Disorders (290-315)		1.2				
Psychoses (290-299)	5.1		-	-	3.3	0
(290 Senile and presenile dementia)						
(295 Schizophrenia)						
(296 Affective psychoses)						
Neuroses, Personality Disorders, and Other Nonpsychotic Mental Disorders						
300 Neuroses	3.8		-	1.5	4.0	15
301 Personality disorders	7.9		-	2.0	4.3	10
305 Physical disorders of presumably psychogenic origin	2.4		-	2.2	2.5	20
306 Special symptoms not elsewhere classified	1.5		-	1.7	2.0	25
308 Behavior disorders of childhood	3.6		-	3.2	3.3	25
Other (300-309)	4.9		-	-	5.0	25
(302 Sexual deviation)						
(303 Alcoholism)						
(304 Drug dependence)						
(307 Transient situational disturbances)						
Mental Retardation (310-315)	-		-	-	4.0	25
(313 Severe mental retardation)						
(315 Unspecified mental retardation)						

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 N/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Mendenhall(4/)		
VI. Diseases of the Nervous System and Sense Organs (320-389)		2.0				
Inflammatory Diseases of Central Nervous System						
320 Meningitis	1.0		4.8	2.8	4.0	0
Hereditary and Familial Diseases of Nervous System						
(330-333)	-		-	-	3.0	0
(330 Hereditary neuromuscular disorders)						
Other Diseases of Central Nervous System						
345 Epilepsy	2.7		3.7	9.4	4.0	10
346 Migraine	3.0		-	1.3	3.5	20
Other (340-349)	2.8		-	-	4.0	15
(342 Paralysis agitans)						
(343 Cerebral spastic infantile paralysis)						
(344 Other cerebral paralysis)						
(347 Other diseases of brain)						
(349 Other diseases of spinal cord)						
Diseases of Nerves and Peripheral Ganglia						
350 Facial paralysis	1.7		-	2.0	2.0	0
Inflammatory Diseases of the Eye						
360 Conjunctivitis and ophthalmia	1.3		4.0	1.1	2.0	20
364 Iritis	2.8		-	2.5	2.0	0
368 Inflammation of lacrimal glands & ducts	1.4		-	1.6	1.5	10
[369 Other inflammatory diseases of eye	1.2		-	1.3	1.5**	0
378] Other diseases of eye	2.0		-	1.4		

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** Conditions within brackets were grouped and responded to as one condition.

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ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Mendenhall(4/)		
Other Diseases and Conditions of Eye						
379 Blindness	2.0		-	1.0	1.0	0
Other (370-379)	3.0		-	-	2.0	3
(371 Corneal opacity)						
(374 Cataract)						
(377 Other diseases of retina and optic nerve)						
Diseases of the Ear and Mastoid Process						
380 Otitis externa	1.6		2.2	1.5		
381 Otitis media without mention of mastoiditis	2.3		2.1	1.6	2.0**	25
384 Other inflammatory diseases of ear	1.2		-	1.3		
387 Other diseases of ear and mastoid process	1.7		2.1*	1.8	2.0	0
389 Other deafness	2.3		-	1.0	2.0	5
Other (380-389)	3.7		-	-	3.0	0
(382 Otitis media with mastoiditis)						
(383 Mastoiditis without mention of otitis media						
(385 Meniere's disease)						
(386 Otosclerosis)						
VII. Diseases of the Circulatory System (390-458)		1.4				
Active Rheumatic Fever (390-392)	3.6		-	-	5.0	0
(390 Rheumatic fever without mention of heart involvement)						
(391 Rheumatic fever with heart involvement)						
(392 Chorea)						

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TABLE 24

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON NORMS OF CARE AND DELEGATION

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Chronic Rheumatic Heart Disease (393-398)	-		-	-	2.3	20
(395 Diseases of aortic valve)						
(398 Other heart disease, specified as rheumatic)						
Hypertensive Disease						
401 Essential benign hypertension	3.3		-	10.0	6.0	28
Other (400-404)	-		-	-	6.0	25
(402 Hypertensive heart disease)						
Ischemic Heart Disease (410-414)	5.9		-	-	7.5	0
(410 Acute myocardial infarction)						
(412 Chronic ischemic heart disease)						
(413 Angina pectoris)						
Other forms of heart disease						
427 Symptomatic heart disease	2.7		-	3.5	3.0	0
Other (420-429)	3.1		-	-	4.0	5
(420 Acute pericarditis, nonrheumatic)						
(421 Acute and subacute endocarditis)						
(422 Acute myocarditis)						
(423 Chronic disease of pericardium, nonrheumatic)						
(424 Chronic disease of endocardium)						
(428 Other myocardial insufficiency)						
Diseases of Arteries, Arterioles, and Capillaries						
448 Diseases of capillaries	1.0		-	1.0	2.0	0

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1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Henderhall(4/)		
Diseases of Veins and Lymphatics, and Other Diseases of Circulatory System (450-458)	2.8		-	-	2.0	0
(451 Phlebitis and thrombophlebitis)						
(453 Other venous embolism and thrombosis)						
(454 Varicose veins of lower extremities)						
(455 Hemorrhoids)						
(456 Varicose veins of other sites)						
(457 Noninfective disease of lymphatic channels)						
(458 Other diseases of circulatory system)						
VIII. Diseases of the Respiratory System (460-519)		1.6				
Acute Respiratory Infection, Except Influenza						
460 Acute nasopharyngitis (common cold)	1.6		1.3	1.4	1.5	63
461 Acute sinusitis	1.8		7.2	1.0	2.0	13
462 Acute pharyngitis	1.7		-	1.1	1.5	50
463 Acute tonsillitis	1.7		-	1.2	1.5	50
464 Acute laryngitis and tracheitis	2.0		1.3	1.1	2.0	28
465 Acute upper respiratory infection of multiple or unspecified sites	1.7		-	1.3	1.5	50
466 Acute bronchitis and bronchiolitis	1.5		1.3	1.4	2.8	25
Influenza						
470 Influenza, unqualified	1.3		1.5	1.4	1.5	25
472 Influenza with other respiratory manifestations	1.5		1.5	1.0	1.5	28
Other (470-474)	-		-	-	1.5	50
(473 Influenza with digestive manifestations)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Pneumonia						
480 Viral pneumonia	1.4		3.0	1.3	3.0	15
483 Pneumonia due to other specified organism	2.0		3.0	1.5	3.0**	10
485 Bronchopneumonia, unspecified	2.1		-	1.8		
486 Pneumonia, unspecified	2.3		-	1.3		
Bronchitis, Emphysema, and Asthma						
490 Bronchitis, unqualified	2.0		-	1.6	3.0**	25
491 Chronic bronchitis	-		-	1.3		
493 Asthma	8.1		4.3	5.5	5.0	28
Other Diseases of Upper Respiratory Tract						
500 Hypertrophy of tonsils and adenoids	2.2		-	1.3	1.0	20
501 Peritonsillar abscess	3.2		-	2.5	2.0	0
502 Chronic pharyngitis and nasopharyngitis	2.4		-	1.4	2.0	25
503 Chronic sinusitis	1.7		5.7	1.6	2.0	20
507 Hay fever	6.6		18.4	5.8	4.0	50
508 Other diseases of upper respiratory tract	1.7		-	6.0	2.0	10
Other Diseases of Respiratory System						
512 Spontaneous pneumothorax	-		1.0	1.0	2.0**	5
519 Other diseases of respiratory system	1.9		-	1.6		
Other (510-519)	1.6		-	-		
(510 Empyema)						
(511 Pleurisy)						
(513 Abscess of lung)						
(514 Pulmonary congestion and hypostasis)						
(517 Other chronic interstitial pneumonia)						
(518 Bronchiectasis)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	HAMCS(1/)	CMP(2/)	Schonfeld(3/)	Mendenhall(4/)		
IX. Diseases of the Digestive System (520-577)			1.2			
Diseases of Oral Cavity, Salivary Glands, and Jaws						
520 Disorders of tooth development and eruption	1.3		-	1.0	1.0	50
528 Diseases of the oral soft tissues, excluding gingiva and tongue	1.1		-	1.5	1.0	25
Other (520-529)	1.3		-	-	1.4	25
(521 Diseases of hard tissues of teeth)						
(522 Diseases of pulp and periapical tissues)						
(523 Periodental diseases)						
(525 Other diseases and conditions of the teeth and supporting structures)						
(526 Diseases of the jaws)						
(527 Diseases of the salivary glands)						
(529 Diseases of the tongue and other oral conditions)						
Diseases of Esophagus, Stomach, and Duodenum						
535 Gastritis and duodenitis	1.2		-	1.1	2.0	18
536 Disorders of function of stomach	1.4		-	1.0	1.5	10
Other (530-537)	1.5		-	-	4.5	10
(530 Diseases of esophagus)						
(531 Ulcer of stomach)						
(532 Ulcer of duodenum)						
(533 Peptic ulcer, site unspecified)						
(537 Other diseases of stomach and duodenum)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Henderhall(4/)		
Appendicitis						
540 Acute appendicitis	1.7		1.3	1.1	1.5**	0
Other (540-543)	1.7		-	-		
(541 Appendicitis, unqualified)						
(543 Other diseases of appendix)						
Hernia of Abdominal Cavity						
550 Inguinal hernia without mention of obstruction	1.8		1.0	1.0	1.2	10
Other (550-553)	1.6		-	-	1.0	30
(551 Other hernia of abdominal cavity without mention of obstruction)						
(553 Other hernia of abdominal cavity with obstruction)						
Other Diseases of Intestine and Peritoneum						
564 Functional disorders of intestines	1.8		1.1*	1.5	2.0	28
565 Anal fissure and fistula	2.1		3.1*	1.4	3.0	20
569 Other diseases of intestines and peritoneum	1.9		-	1.3	2.0	5
Other (560-569)	2.4		-	-	4.0	8
(560 Intestinal obstruction without mention of hernia)						
(561 Gastroenteritis and colitis, except ulcerative, of noninfectious origin)						
(563 Chronic enteritis and ulcertaive colitis)						
(566 Abscess of anal and rectal regions)						
(568 Peritoneal adhesions)						

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Mendenhall(4/)		
Diseases of Liver, Gallbladder, and Pancreas (570-577)	2.7		-	-	4.0	0
(573 Other diseases of liver)						
(574 Cholelithiasis)						
(575 Cholecystitis and cholangitis, without mention of calculus)						
(576 Other diseases of gallbladder and biliary ducts)						
X. Diseases of the Genitourinary System (580-629)		1.5				
Nephritis and Nephrosis						
Other (580-584)	2.1		-	-		
(581 Nephrotic syndrome)						
(583 Nephritis, unqualified)						
(584 Renal sclerosis, unqualified)					4.0**	5
Other Diseases of Urinary System						
590 Infections of kidney	2.0		4.2	2.5		
593 Other diseases of kidney and ureter	4.7		4.2*	18.2		
595 Cystitis	1.3		4.2	1.7	3.0	20
597 Urethritis (nonvenereal)	1.5		4.2	1.6	2.0	20
598 Stricture of urethra	4.3		4.0	1.2	2.0	0
599 Other diseases of urinary tract	2.0		4.2*	1.6	2.0	0
Other (590-599)	4.7		-	-	4.0	0
(591 Hydronephrosis)						
(594 Calculus of other parts of urinary system)						
(596 Other diseases of bladder)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	HAMCS(1/)	CMP(2/)	Schonfeld(3/)	Henderhall(4/)		
Diseases of Male Genital Organs (600-607)	1.5		-	-	2.0	7.5
(601 Prostatitis)						
(602 Other diseases of prostate)						
(603 Hydrocele)						
(604 Orchitis and epididymitis)						
(605 Redundant prepuce and phimosis)						
(607 Other diseases of male genital organs)						
Diseases of Breast, Ovary, Fallopian Tube, and Parametrium (610-616)	1.3		-	-	2.0	10
(610 Chronic cystic disease of breast)						
(611 Other diseases of breast)						
(616 Diseases of parametrium and pelvic peritoneum (female)						
Diseases of Uterus and Other Female Genital Organs						
620 Infective diseases of cervix uteri	1.0		-	1.0	2.0	20
622 Infective diseases of uterus (except cervix), vagina and vulva	1.8		-	1.0	2.0	8
Other (620-629)	1.6		-	-	2.0	20
(623 Uterovaginal prolapse)						
(626 Disorders of menstruation)						
(629 Other diseases of female genital organs)						
XI. Complications of Pregnancy, Childbirth and the Puerperium (630-678)		-				
XII. Diseases of the Skin and Subcutaneous Tissue (680-709)		2.9				

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1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schön-feld(3/)	Menden-hall(4/)		
Infections of Skin and Subcutaneous Tissue						
680 Boil and carbuncle	1.2		4.8	1.5	2.0	25
681 Cellulitis of finger and toe	1.3		4.8	1.3	2.0	25
682 Other cellulitis and abscess	1.7		4.8	1.4	2.0	28
684 Impetigo	1.1		1.1	1.1	1.5	50
686 Other local infections of skin and subcutaneous tissue	1.2		-	1.3	1.5	18
Other (680-686)	1.6		-	-	2.0	18
(683 Acute lymphadenitis)						
(685 Pilonidal cyst)						
Other Inflammatory Conditions of Skin and Subcutaneous Tissue						
691 Infantile eczema and related conditions	2.3		2.5	1.3	4.0	25
692 Other eczema and dermatitis	2.0		1.1*	4.4	2.5 A/	25
696 Psoriasis and similar disorders	1.5		-	4.0	2.0	23
Other (690-698)	1.4		-	-	2.0	40
(690 Seborrheic dermatitis)						
(695 Erythematous conditions)						
(697 Lichen)						
(698 Pruritus and related conditions)						
Other Diseases of Skin and Subcutaneous Tissue						
701 Other hypertropic and atropic conditions of skin	1.7		-	1.1	1.7	10
703 Diseases of nail	1.6		-	1.3	1.5	18
706 Diseases of sebaceous glands	3.6		1.6*	1.4	2.0 C/	30
708 Urticaria (continued on next page)	1.3		2.8	1.1		

A/ Modeling Panel, Child Care Panel 3.5 visits.

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C/ Modeling Panel, Child Care Panel 4.0 visits.

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
709 Other diseases of skin	1.4		-	1.1	2.0**	15
Other (700-709)	1.3		-	-	1.5	10
(700 Corns and callosities)						
(702 Other dermatoses)						
(704 Diseases of hair and hair follicles)						
(705 Diseases of sweat glands)						
(707 Chronic ulcer of skin)						
XIII. Diseases of the Musculoskeletal System and Connective Tissue (710-738)		1.2				
Arthritis and Rheumatism, except Rheumatic Fever						
712 Rheumatoid arthritis and allied conditions	6.0		-	2.6		
713 Osteoarthritis and allied conditions	9.4		-	-		
715 Arthritis, unspecified	2.6		-	2.2	5.0**	15
717 Other nonarticular rheumatism	1.3		-	1.1		
Other (710-718)	-		-	-		
(714 Other specified forms of arthritis)						
Osteomyelitis and Other Diseases of Bone and Joint						
723 Other diseases of bone	3.9		-	2.9	2.0	0
Other (720-723)	1.9		-	-	2.0	0
(722 Osteochondrosis)						
(724 Internal derangement of joint)						
(725 Displacement of intervertebral disc)						
(728 Vertebrogenic pain syndrome)						
(729 Other diseases of joint)						

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Other Diseases of Musculoskeletal System						
731 Synovitis, bursitis, and tenosynovitis	1.5		-	1.2	3.0	10
738 Other deformities	3.0		-	2.2	1.5	5
Other (730-738)	2.4		-	-	4.0	10
(732 Infective myositis and other inflammatory diseases of tendon and fascia)						
(733 Other diseases of muscle, tendon, and fascia)						
(734 Diffuse diseases of connective tissue)						
(735 Curvature of spine)						
(736 Flat foot)						
(737 Hallux valgus and varus)						
XIV. Congenital Anomalies (740-759)		1.1				
741 Spina bifida	-		-	131.4	4.0	0
743 Other congenital anomalies of nervous system	2.0		-	2.0	2.0	0
746 Congenital anomalies of heart	9.7		-	4.8	3.0 A/	10
747 Other congenital anomalies of circulatory system	-		9.8*	4.0	3.5	5
750 Other congenital anomalies of upper alimentary tract	2.8		2.1*	1.5	2.0	0
752 Congenital anomalies of genital organs	1.9		2.6*	1.6	2.0	10
753 Congenital anomalies of urinary system	18.9		4.0*	1.0	5.0	10
754 Clubfoot (congenital)	3.5		7.7	1.0	2.0	5

A/ Modeling Panel, Child Care Panel 6.0 visits.

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Manden-hall(4/)		
755 Other congenital anomalies of limbs	2.1		2.3*	1.7	2.0	5
757 Congenital anomalies of skin, hair, and nails	1.1		-	1.5	1.5	5
759 Congenital syndromes affecting multiple systems	4.1		3.0*	11.0	5.0	5
Other (740-759)	2.3		-	-	2.5	5
(742 Congenital hydrocephalus)						
(744 Congenital anomalies of eye)						
(748 Congenital anomalies of respiratory system)						
(749 Cleft palate and cleft lip)						
(751 Other congenital anomalies of digestive system)						
(756 Other congenital anomalies of musculoskeletal system)						
(758 Other and unspecified congenital anomalies)						
XV. Certain Causes of Perinatal Morbidity and Mortality (760-779)						
775 Hemolytic disease of newborn without mention of kernicterus	-		-	2.8	3.0	5
777 Immaturity, unqualified	-		-	2.6	2.0	10

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	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
778 Other conditions of fetus or newborn	3.3		-	1.8	2.0	5
Other (760-779)	-		-	-	2.0	0
(762 Toxemia of pregnancy)						
(768 Difficult labor with other and unspecified complications)						
(769 Other complications of pregnancy and childbirth)						
(771 Conditions of umbilical cord)						
(772 Birth injury without mention of cause)						
(774 Hemolytic disease of newborn with kernicterus)						
XVI. Symptoms and Ill-Defined Conditions (780-796)		1.0				
Symptoms Referable to Systems or Organs						
780 Certain symptoms referable to nervous system and special senses	2.3		-	2.8	2.0	5
781 Other symptoms referable to nervous system and special senses	2.2		-	5.2	2.0	0
782 Symptom referable to cardio-vascular and lymphatic system	1.4		-	1.7	2.0	10
783 Symptom referable to respiratory system	2.0		2.3*	1.4	2.0	25
784 Symptom referable to upper gastrointestinal tract	1.5		-	1.5	1.5	10
785 Symptom referable to abdomen and lower gastrointestinal tract	1.5		-	1.5	1.5	28
786 Symptom referable to genito-urinary system	2.4		2.2*	1.5	2.0	10

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Note: Columns 6 and 7 represent the responses. Footnotes appear at the end of Table 24. See footnote 3/ for explanation of asterisk.

TABLE 24

GENERAL CHILD MEDICAL CARE DELPHI PANEL RESPONSES ON NORMS OF CARE AND DELEGATION

(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
787 Symptoms referable to limbs and joints	1.9		-	1.4	1.5	15
788 Other general symptoms	1.9		-	1.4	1.5	15
Other (780-789)	-		-	-	2.0	0
(789 Abnormal urinary constituents of unspecified cause)						
Senility and Ill-Defined Diseases						
790 Nervousness and debility	1.8		-	3.2	3.0	30
791 Headache	1.7		-	1.3	1.5	30
793 Observation, without need for further medical care	1.8		-	1.0	1.5	30
796 Other ill-defined and unknown causes of morbidity and mortality	1.5		-	3.6	2.0	10
XVII. Accidents, Poisonings, and Violence (Nature of Injury) (800-999)		-				
Fracture of Skull, Spine, and Trunk						
803 Other and unqualified skull fractures	1.1		3.0	1.0	2.0	0
Other (800-809)	2.0		-	-	2.0	5
(801 Fracture of base of skull)						
(802 Fracture of face bones)						
(805 Fracture and fracture dislocation of vertebral column without mention spinal cord lesion)						
(807 Fracture rib(s), sternum, and larynx)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 a/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Fracture of Upper Limb						
810 Fracture of clavicle	1.4		-	1.6	3.0	10
813 Fracture of radius and ulna	2.3		-	1.6	3.0	5
814 Fracture of carpal bone(s)	2.2		-	2.0	2.0	3
816 Fracture of one or more phalanges of hand	2.1		-	1.8	2.0	10
Other (810-819)	3.1		-	-	1.5	0
(811 Fracture of scapula)						
(812 Fracture of humerus)						
(815 Fracture of metacarpal bone(s))						
(817 Multiple fractures of hand bones)						
(818 Other, multiple, and ill-defined fractures of upper limb)						
Fracture of Lower Limb						
Other (820-829)	3.0		-	-	4.0	0
(820 Fracture of neck of femur)						
(822 Fracture of patella)						
(823 Frature of tibia and fibula)						
(824 Fracture of ankle)						
(825 Fracture of one or more tarsal and metatarsel bones)						
(826 Fracture of one or more phalanges of foot)						
(827 Other, multiple, and ill-defined fractures of lower limb)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CHP(2/)	Schonfeld(3/)	Mendenhall(4/)		
Dislocation Without Fracture (830-839)	2.1		-	-	3.0	5
(830 Dislocation of jaw)						
(831 Dislocation of shoulder)						
(832 Dislocation of elbow)						
(833 Dislocation of wrist)						
(834 Dislocation of finger)						
(835 Dislocation of hip)						
(836 Dislocation of knee)						
(839 Other, multiple, and ill-defined dislocation)						
Sprains and Strains of Joints and Adjacent Muscles						
845 Sprains and strains of ankle and foot	1.3		2.8	1.0	2.5	33
847 Sprains and strains of other and unspecified parts of back	1.4		2.8	1.1	2.0	20
Other (840-848)	1.4		-	-	2.0	20
(840 Sprains and strains of shoulder and upper arm)						
(841 Sprains and strains of elbow and forearm)						
(842 Sprains and strains of wrist and hand)						
(843 Sprains and strains of hip and thigh)						
(844 Sprains and strains of knee and leg)						
(846 Sprains and strains of sacroiliac region)						
(848 Other and ill-defined sprains and strains)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	MAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Intracranial Injury (excluding those with skull fracture)						
850 Concussion	1.2		1.1	1.2	2.5	5
[851 Cerebral laceration and contusion	4.1		1.1	2.5		
854 Intracranial injury of other and unspecified nature]	1.1		1.1	1.1	4.0**	5
Laceration and Open Wound of Head, Neck, and Trunk						
870 Open wound of eye and orbit	1.8		3.1	1.2	2.0	0
873 Other and unspecified laceration of head	1.4		1.1	1.2	2.4	0
Other (870-879)	-		-	-	2.0	0
(871 Enucleation of eye)						
(872 Open wound of ear)						
(874 Open wound of neck)						
(875 Open wound of chest (wall)						
(876 Open wound of back)						
(877 Open wound of buttock)						
(878 Open wound of genital organs (external) including traumatic amputation)						
(879 Other, multiple, and unspecified open wounds of head, neck, and, trunk)						
Laceration and Open Wound of Upper Limb						
883 Open wound of finger(s)	1.3		3.1	1.3	2.0	10
Other (880-887)	1.8		-	-	1.0	3
(880 Open wound of shoulder and upper arm)						

continued on next page

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
(881 Open wound of elbow, forearm, and wrist)						
(882 Open wound of hand except finger(s) alone)						
(884 Multiple and unspecified open wound of upper limb)						
(885 Traumatic amputation of thumb (complete) (partial))						
(886 Traumatic amputation of other finger(s) (complete))						
(887 Traumatic amputation of arm and hand (complete) (partial))						
Laceration and Open Wound of Lower Limb (890-897)	1.3		-	-	1.2	1
(890 Open wound of hip and thigh)						
(891 Open wound of knee, leg (except thigh), and ankle)						
(892 Open wound of foot, except toe(s) alone)						
(893 Open wound of toe(s))						
(894 Multiple and unspecified open wound of lower limb)						
(895 Traumatic amputation of toe(s) (complete) (partial))						
(896 Traumatic amputation of foot (complete) (partial))						
(897 Traumatic amputation of leg(s) (complete) (partial))						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Henderhall(4/)		
Laceration and Open Wound of Multiple Location						
907 Multiple open wounds of other and unspecified location	1.3		3.1	1.1	2.0	0
Superficial Injury						
910 Superficial injury of face, neck, and scalp	1.1		1.1	1.0	1.5**	10
Other (910-918)	1.1		-	-		
(911 Superficial injury of trunk)						
(912 Superficial injury of shoulder and upper arm)						
(913 Superficial injury of elbow, forearm, and wrist)						
(914 Superficial injury of hand(s), except finger(s) alone)						
(915 Superficial injury of finger(s))						
(916 Superficial injury of hip, thigh, leg, and ankle)						
(917 Superficial injury of foot and toe(s)						
(918 Superficial injury of other, multiple, and unspecified sites)						
Contusion and Crusing with Intact Skin Surface						
920 Contusion of face, scalp, and neck except eye(s)	1.1		1.1	1.1	1.5**	20

Continued on next page

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1 *	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 3/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Mendan-hall(4/)		
927 Contusion of hip, thigh, leg, and ankle	1.3		-	1.0		
Other (920-929)	1.2		-	-		
(921 Contusion of eye and orbit)						
(922 Contusion of trunk)						
(923 Contusion of shoulder and upper arm)						
(924 Contusion of elbow, forearm, and wrist)						
(925 Contusion of hand(s), except finger(s) alone)						
(926 Contusion of finger(s)						
(928 Contusion of foot and toe(s)						
(929 Contusion of other, multiple, and unspecified sites)						
Effect of Foreign Body, Entering Through Orifice						
930 Foreign body in eye and adnexa	1.2		-	1.0	1.5	8
Other (930-939)	1.2		-	-	1.3	15
(931 Foreign body in ear)						
(932 Foreign body in nose)						
(933 Foreign body in pharynx and larynx)						
(935 Foreign body in mouth, esophagus, and stomach)						
(936 Foreign body in intestine and colon)						
(938 Foreign body in digestive system, unspecified)						
(939 Foreign body in genitourinary tract)						

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Child (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Menden-hall(4/)		
Burn (940-949)	1.7		-	-	3.0	15
(940 Burn confined to eye)						
(941 Burn confined to face, head, and neck)						
(942 Burn confined to trunk)						
(943 Burn confined to upper limb except wrist and hand)						
(944 Burn confined to wrist(s) and hand(s))						
(945 Burn confined to lower limb(s))						
(946 Burn involving face, head, neck, with limb(s))						
(947 Burn involving trunk with limb(s))						
(948 Burn involving face, head, and neck, with trunk and limb(s))						
(949 Burn involving other and unspecified parts)						
Injury to Nerves and Spinal Cord (950-959)	1.3		-	-	1.0	0
(952 Injury to nerve(s) in upper arm)						
(954 Injury to nerve(s) in wrist and hand)						
(956 Injury to nerve(s) in lower leg)						
(957 Injury to nerve(s) in ankle and foot)						
(958 Spinal cord lesion without evidence of spinal bone injury)						
(959 Other nerve injury including nerve injury in several parts)						

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1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schon-feld(3/)	Henden-hall(4/)		
Adverse Effect of Medicinal Agents						
965 Adverse effect of analgesics and antipyretics	1.0		1.0*	-		
Other (960-979)	1.1		-	-	2.0 A/ **	5
(960 Adverse effect of antibiotics)						
(961 Adverse effect of other anti-infectives)						
(962 Adverse effect of hormones and synthetic substitutes)						
(969 Adverse effect of local anesthetics)						
(977 Adverse effect of other and unspecied drugs)						
(979 Alcohol in combination with specified medicinal agents)						
Toxic Effect of Substances Chiefly Nonmedicinal as to Source						
981 Toxic effect of petroleum products	-		1.5	-		
982 Toxic effect of industrial solvents	-		1.6	-		
983 Toxic effect of corrosive aromatics, acids, and caustic alkalis	-		6.1	-		
989 Toxic effect of other substances chiefly nonmedicinal as to source	1.7		3.0 1.9	7.2		
Other (980-989)	2.1		-	-	3.0	5
(984 Toxic effect of lead and its compounds (including fumes)						
(987 Toxic effect of other gases, fumes, or vapors)						

A/ Modeling Panel, Child Care Panel 2.5 visits.

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(Includes Recommendations of Modeling Panel on Ambulatory Care Service Requirements for Pediatric Conditions)

1	2	3	4	5	6	7
	Current Norms of Care (Visits)				1990 Norms of Care (Visits) for General Child Care Provider	% of Visits That Should be Delegated to NP Health Care Provider in 1990 B/
ICDA & Diagnosis	NAMCS(1/)	CMP(2/)	Schonfeld(3/)	Menden-hall(4/)		
Other Adverse Effects						
992 Effects of heat	1.0		-	1.0	1.5	0
996 Injury, other and unspecified	1.3		-	1.4	2.0	20
999 Other complications of medical care	5.8		-	6.3	1.5	10
Other (990-999)	2.8		-	-	2.0	10
(991 Effects of reduced temperature and excessive dampness)						
(994 Effects of other external causes)						
(998 Other complications of surgical procedures)						
Special Conditions and Examinations Without Sickness (Y00-Y13)						
Y00.5 Well baby and child care	3.1		-	-	N/A	20
Y06 Prenatal care	2.8		-	4.0	1.5	15
Y09 Other person without complaint or illness	1.1		-	2.0	2.0	50
Y10 Medical and surgical after care	5.9		-	1.4	3.0	20
Other	2.2		-	-	2.2	20
(Y01 Skin immunity and sensitization tests)						
(Y03 Follow-up examination with no need for further care or need for only limited care)						
(Y04 Contacts with infective and parasitic diseases)						
(Y07 Postpartum observation)						
(Y13 Social maladjustment without manifest psychiatric disorder)						

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Footnotes to Table 24

(1/) The data contained in this table have been derived from special tabulations of the National Center for Health Statistics' National Ambulatory Medical Care Survey (NAMCS). The data cover the two-year period 1975-76, and include an annual average number of ambulatory visits per ICDA condition for patients ages 0-16. The number of visits per condition is derived from the NAMCS estimates of the number of first-time visits and subsequent visits for each illness condition. However, the NAMCS records visits on the basis of perceived patient problem rather than diagnosed illness condition (ICDA); these estimates may be biased to the extent that patient problem may not correspond to diagnosed illness condition because of shifts in ICDA diagnosis for a constant patient problem or shifts in the perceived patient problem for a constant ICDA diagnosis. It should also be noted that these empirical norms of care are not specialty-specific; they are in effect implicit weighted averages of the norms of all physician specialties contained in the NAMCS survey.

(2/) The norms of care included in this table have been derived from special tabulations contained in Utilization of Health and Mental Health Outpatient Services in an Organized Medical Care Setting: Columbia Medical Plan. Health Services Research and Development Center, Johns Hopkins University. (Final Report of NIMH Contract No. 278-76-0058). The norms were derived by dividing total visits made in 1975 in the Pediatric Department of the Columbia Medical Plan by total patients seen in the Pediatric Department of the CMP.

(3/) The norms of care included in this table have been derived from Table 9; "Number of attendences per 100 pediatric patients in the mixture of new and carry-over patients with the specified disease who should have attendances during an average year of care with primary-physician pediatricians at the particular location for diagnosis, evaluation, treatment, and/or follow-up, and the average time per attandance", in Schonfeld, H.K., et. al., Standards for Good Medical Care: Based on the Opinions of Clinicians Associated with the Yale-New Haven Medical Center with Respect to 242 Diseases, Vol. II, DHEW Publication No. (SSA) 75-11926, 1975. It should be noted that many of the norms of care derived from Table 9 refer to specific 4-digit ICDA conditions, or conditions representing components of the 3-digit ICDA conditions presented in this table. Such norms have been asterisked.

(4/) The norms of care included in this table have been derived from special tabulations developed from the Physicians' Activities Survey conducted by the University of Southern California. The survey for Pediatricians, conducted in late 1977, includes data for the average number of visits per ICDA condition when the last visit

was held in an ambulatory setting. It should be noted that the survey's log-diary form used to record the physician's responses did not have any time limit associated with the onset of any particular problem requiring visits; the number of visits for any chronic problem may therefore be thought of as providing upper bounds to the average number of visits per chronic condition experienced annually by the pediatrician. See Mendenhall, R.C., et. al, Pediatrics Practice Study Report, University of Southern California (Contract No. HRA 231-77-0115), 1979; for background material on the Pediatrics survey as well as published tabulations resulting from the survey.

APPENDIX C

SUBSPECIALTY CHILD MEDICAL CARE DELPHI PANEL RESPONSES

ABBREVIATIONS TO TABLES 25, 26, and 27

LIST OF THE SIX PEDIATRIC SUBSPECIALISTS

ABBREVIATION	TITLE
PNE	Pediatric Nephrologist
PDA	Pediatric Allergist
PDC	Pediatric Cardiologist
PEN	Pediatric Endocrinologist
PHO	Pediatric Hematologist-Oncologist
NEO	Neonatal-Perinatal Medicine

LIST OF OTHER SPECIALISTS

ABBREVIATION	TITLE
DERM	Dermatologist
GE	Gastroenterologist
ID	Infectious Disease Specialist
OTO	Otorhinolaryngologist
PD	Pulmonary Disease Specialist

TABLE 25
AMBULATORY CARE REQUIREMENTS FOR PEDIATRIC SUBSPECIALTY CONDITIONS
CHILD MEDICAL CARE DELPHI PANEL AND SUBSPECIALIST RESPONSES

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Subspecialist (2)	% of General Child Care Provider's Patients, Ages 0-16 to be Referred to Subspecialty Based on Consensus of Child Medical Care Delphi Panel, 1990 (3)	% of General Child Care Provider's Patients, Ages 0-16 to be Referred to Subspecialty as Perceived by Subspecialist, 1990 (4)	% Requiring Health Care from Sources other than General Child Care Providers as Perceived by Subspecialist, 1990 (5)	1990 Norms of Care (Visits) for Subspecialty as Perceived by Subspecialist (6)	% of Visits to Subspecialty that Should be Delegated to Non-Physician Health Care Providers as Perceived by Subspecialist, 1990 (7)
I. Infective and Parasitic Diseases (000-136)						
Intestinal Infectious Diseases						
009 Diarrheal diseases	4,500	0 PDA	3 PDA	2 (from GE and ID)	1.0	0
Other Viral Diseases						
075 Infectious mononucleosis	300	1 PHO	5 PHO	0	3.0	0
112 Moniliasis	6	100 PDA	100 PDA	0	1.5	0
II. Primary Cancer Sites						
Buccal Cavity and Pharnyx	1	100 PHO	100 PHO	0	8.4	50
Digestive System	1	100 PHO	100 PHO	0	8.4	50
Respiratory System	1	100 PHO	100 PHO	0	8.4	50
Female Genital System	1	100 PHO	100 PHO	0	8.4	50
Male Genital System	1	100 PHO	100 PHO	0	8.4	50
Urinary System	5	100 PHO 100 PNE	100 PHO 100 PNE	0 0	8.4 1.0	50 0

TABLE 25

AMBULATORY CARE REQUIREMENTS FOR PEDIATRIC SUBSPECIALTY CONDITIONS
CHILD MEDICAL CARE DELPHI PANEL AND SUBSPECIALIST RESPONSES

ICDA & Diagnosis (1)	1990 Adjusted Rate per 100,000 Ages 0-16 as Perceived by Subspecialist (2)	% of General Child Care Provider's Patients, Ages 0-16 to be Referred to Subspecialty Based on Consensus of Child Medical Care Delphi Panel, 1990 (3)	% of General Child Care Provider's Patients, Ages 0-16 to be Referred to Subspecialty as Perceived by Subspecialist, 1990 (4)	% Requiring Health Care from Sources other than General Child Care Providers as Perceived by Subspecialist, 1990 (5)	1990 Norms of Care (Visits) for Subspecialty as Perceived by Subspecialist (6)	% of Visits to Subspecialty that Should be Delegated to Non-Physician Health Care Providers as Perceived by Subspecialist, 1990 (7)
Melanoma of the Skin	1	100 PHO	100 PHO	0	10.0	50
Brain and Other Nervous System	10	100 PHO	100 PHO	0	8.4	50
		5 PNE	5 PNE	0	0.6	0
		5 PEN	5 PEN	0	1.0	0
Endocrine System	4	100 PHO	100 PHO	0	4.0	50
		5 PNE	5 PNE	0	0.6	0
		50 PEN	50 PEN	0	1.0	0
Bone and Connective Tissue	6	100 PHO	100 PHO	0	10.0	50
Lymphomas	7	100 PHO	100 PHO	0	12.8	50
Leukemia	10	100 PHO	100 PHO	0	17.2	50
		25 PEN	25 PEN	0	1.0	0
III. Endocrine, Nutritional, and Metabolic Diseases (240-279)						
Diseases of Thyroid Gland						
243 Cretinism of congenital origin	20	37.5 PEN	100 PEN	5 (From NEO)	0.5	0
244 Myxedema	31	50 PEN	100 PEN	0	0.25	0
Other (240-246) (240 Simple goiter) (241 Nontoxic nodular goiter) (245 Thyroiditis)	12	50 PEN	50 PEN	0	2.0	0

TABLE 25

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Diseases of Other Endocrine Glands						
250 Diabetes mellitus	110	50 PEN	50 PEN	10	1.0	10
Other (250-258)	6	92.5 PEN	95 PEN	0	2.0	0
(251 Disorders of pancreatic internal secretion other than diabetes mellitus)						
(252 Diseases of parathyroid gland)						
(253 Diseases of pituitary gland)						
(255 Diseases of adrenal glands)						
(256 Ovarian dysfunction)						
(257 Testicular dysfunction)						
(258 Polyglandar dysfunction and other diseases of endocrine glands)						
Avitaminoses and Other Nutritional Deficiency						
269 Other nutritional deficiency	157	0 PEN	10 PEN	0	2.0	0
Other Metabolic Diseases						
270 Congenital disorders of amino-acid metabolism	9	0 PNE	10 PNE	0	2.0	0
		100 PEN	100 PEN	0	2.0	0

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273 Other and unspecified congenital disorders of metabolism	25	0 PNE	10 PNE	0	2.0	0
		82.5 PEN	82.5 PEN	0	2.0	0
275 Plasma protein abnormalities	3	0 PDA	100 PDA	0	4.0	0
		0 PNE	5 PNE	0	0.1	0
277 Obesity not specified as of endocrine origin	500	5 PEN	5 PEN	10	4.0	10
Other (270-279)	109	100 PEN	100 PEN	0	3.0	0
(271 Congenital disorders of carbohydrate metabolism)						
(272 Congenital disorders of lipid metabolism)						
(274 Gout)						
(278 Other hyperalimentation)						
IV. Diseases of the Blood and Blood-Forming Organs (280-289)						
280 Iron deficiency anemias	300	1 PHO	2.5 PHO	0	2.0	0
282 Hereditary hemolytic anemias	58	75 PHO	85 PHO	0	4.0	25
		0 PNE	5 PNE	0	1.0	25
289 Other diseases of blood and blood-forming organs	168	90 PHO	90 PHO	0	3.5	0

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Other (280-289)	1,074	90 PHO	90 PHO	0	4.0	0
(281 Other deficiency anemias)						
(283 Acquired hemolytic anemias)						
(284 Aplastic anemia)						
(285 Other and unspecified anemias)						
(286 Coagulation defects)						
(287 Purpura and other hemorrhagic conditions)						
VII. Diseases of the Circulatory System (390-458)						
Active Rheumatic Fever (390-392)	19	25 PCD	30 PCD	0	1.1	0
(390 Rheumatic fever without mention of heart involvement)						
(391 Rheumatic fever with heart involvement)						
(392 Chorea)						

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Chronic Rheumatic Heart Disease (393-398) (395 Diseases of aortic valve) (398 Other heart disease, specified as rheumatic)	46	90 PCD	100 PCD	0	2.0*	0
Hypertensive Disease						
401 Essential benign hypertension	60	50 PNE 50 PCD	100 PNE 50 PCD	0 0	0.5 0.5*	0 0
Other (400-404) (402 Hypertensive heart disease)	6	100 PCD	100 PCD	0	1.5*	0
Ischemic Heart Disease (410-414) (410 Acute myocardial infarction) (412 Chronic ischemic heart disease) (413 Angina pectoris)	6	100 PCD	100 PCD	0	3.0*	0
Other forms of heart disease						
427 Symptomatic heart disease	200	55 PCD	100 PCD	0	2.0*	0

* Annualized

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Other (420-429) (420 Acute pericarditis, nonrheumatic) (421 Acute and subacute endocarditis) (422 Acute myocarditis) (423 Chronic disease of pericardium, nonrheumatic) (424 Chronic disease of endocardium) (428 Other myocardial insufficiency)	77	90 PCD	90 PCD	0	2.0*	0
Diseases of Arteries, Arterioles, and Capillaries 448 Diseases of capillaries	21	20 PHO	20 PHO	0	2.0	0
Diseases of Veins and Lymphatics, and Other Diseases of Circulatory System (450-458) (451 Phlebitis and thrombophlebitis) (453 Other venous embolism and thrombosis)	131	0 PCD	10 PCD	0	2.5*	0

* Annualized

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(454 Varicose veins of lower extremities)						
(455 Hemorrhoids)						
(456 Varicose veins of other sites)						
(457 Noninfective disease of lymphatic channels)						
(458 Other diseases of circulatory system)						
Bronchitis, Emphysema, and Asthma						
[490 Bronchitis, unqualified and 491 Chronic bronchitis]	4,424**	15 PDA 1/	50 PDA 1/	5 (From PD) 1/	2.0	0
493 Asthma	3,157	20 PDA 2/	80 PDA 2/	5 (From PD) 2/	3.0	20
Other Diseases of Upper Respiratory Tract						
502 Chronic pharyngitis and nasopharyngitis	45	20 PDA	80 PDA	10 (From OTO)	2.0	30
503 Chronic sinusitis	2,923	20 PDA 3/	80 PDA 3/	10 (From OTO) 3/	2.0	30
507 Hay fever	5,000	20 PDA 4/	60 PDA 4/	10 (From OTO) 4/	3.0	40
508 Other diseases of upper respiratory tract	661	15 PDA	30 PDA	10 (From OTO)	3.0	40

1/ For ICDA 490-1, the Modeling Panel recommended a 20 percent total referral to the pediatric allergist.
2/ For ICDA 493, the Modeling Panel recommended a 30 percent total referral to the pediatric allergist.
3/ For ICDA 503, the Modeling Panel recommended a 15 percent total referral to the pediatric allergist.
4/ For ICDA 507, the Modeling Panel recommended a 20 percent total referral to the pediatric allergist.
** Conditions within brackets were grouped and responded to as one condition.

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Other Diseases of Respiratory System						
512 Spontaneous pneumothorax 519 Other diseases of respiratory system Other (510-519) (510 Empyema) (511 Pleurisy) (513 Abscess of lung) (514 Pulmonary congestion and hypostasis) (517 Other chronic interstitial pneumonia) (518 Bronchiectasis)	1,500**	0 PDA	10 PDA	5 (From PD)	2.0	0
X. Diseases of the Genitourinary System (580-629)						
Nephritis and Nephrosis & Other Diseases of Urinary System Other (580-584) (581 Nephrotic syndrome) (583 Nephritis, unqualified) (584 Renal sclerosis, unqualified) 590 Infections of kidney 593 Other diseases of kidney and ureter	1,100**	9.0 PNE	9.0 PNE	0	1.5	30

** Conditions within brackets were grouped and responded to as one condition.

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591 Hydronephrosis	2.7	100 PNE	100 PNE	0	1.0	25
594 Calculus of other parts of urinary system	2.9	100 PNE	100 PNE	0	1.0	25
595 Cystitis	1,201	5 PNE	5 PNE	0	1.0	0
597 Urethritis	55	5 PNE	5 PNE	0	1.0	0
598 Stricture of urethra	124**	100 PNE	100 PNE	0	1.0	25
599 Other diseases of urinary tract						

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XII. Diseases of the Skin and Subcutaneous Tissue (680-709)						
Other Inflammatory Conditions of Skin and Subcutaneous Tissue						
691 Infantile eczema and related conditions	46	15 PDA	30 PDA	5 (From Derm)	3.0	40
692 Other eczema and skin disease	3,711	0 PDA	10 PDA	5 (From Derm)	3.0	40
Other Diseases of Skin and Subcutaneous Tissue						
[708 Urticaria	380**	5 PDA	5 PDA	10 (From Derm)	3.0	20
709 Other diseases of skin]						
XIV. Congenital Anomalies (740-759)						
746 Congenital anomalies of heart	642	90 PCD	100 PCD	0	2.0*	0
747 Other congenital anomalies of circulatory system	15	100 PCD	100 PCD	0	2.0*	0
752 Congenital anomalies of genital organs	9	62.5 PEN	62.5 PEN	0	0.25	0
		0 PNE	10 PNE	0	1.0	0
759 Congenital syndromes affecting multiple systems	265	0 PEN	10 PEN	0	0.25	0
		10 PCD	20 PCD	0	1.0*	0

*Annualized

** Conditions within brackets were grouped and responded to as one condition.

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XVI. Symptoms and Ill-Defined Conditions (780-796)						
782 Symptoms referable to cardiovascular and lymphatic system	880	25 PCD	30 PCD	0	1.1	0
Other (780-789)	6	10 PNE	10 PNE	0	0.3	25
(789 Abnormal urinary constituents of unspecified cause)						
Additional Ambulatory Care Requirements for Pediatric Subspecialty Conditions*						
Nos 1 Short Stature and Delayed Adolescence	3,000	N/A	10 PEN	0	1.0	0
Nos 2 Precocious Sexual Development	900	N/A	50 PEN	0	2.0	0
Nos 3 Familial Tall Stature	1,000	N/A	10 PEN	0	1.0	0
Nos 4 Referral for functional murmur	1,240	N/A	2 PCD	0	1.0	0

* The following conditions (for which no specific ICDA code corresponds) were addressed by the subspecialists. The Child Care Delphi Panel implicitly included these conditions in ICDAs that they addressed.

TABLE 26
HOSPITAL DISCHARGES AND SERVICE NORMS
FOR PATIENTS 0-14 FOR 1975 AND 1990, ACCORDING TO INITIAL DIAGNOSIS*
(Pediatric Subspecialist Responses)

Column	1	2	3	4	5	6		7	8	9
ICDA Number	Diagnosis	Number of Discharges in Thousands, 1975	Number of Discharges per 10,000 Population, 1975	True Need per 10,000 Population, 1978	Percent Rate Change True Need 1978-1990	Percent of Adjusted Need that Should be Seen by Pediatric Subspecialist, 1990		Average Length of Stay in Days, 1975	Number of Visits that Should be Made by Pediatric Subspecialist, 1990	Percent of Visits that Should be Delegated to Nonphysician Providers, 1990
140-209	Malignant Neoplasms	25	4.7	5.7	25	100	PHO	10.6	21.2	0
180-189	Malignant Neoplasm of Genitourinary Organs	**	**	0.7	0	50	PNE	5.0	5.0	0
223	Benign Neoplasm of Kidney and Other Urinary Organs	**	**	0.2	0	90	PNE	1.0	1.0	0
280-285	Anemias	22	4.1	5.1	50	100	PHO	4.6	9.2	0
286-289	Other Diseases of the Blood and Blood-Forming Organs	43	8.1	8.1	0	100	PHO	3.8	7.6	0
390-458	Diseases of the Circulatory System	36	6.8	10.0	30	100	PCD	8.2	10.0	0
580-629	Diseases of the Genito-urinary System	221	41.2	41.2	0	100	PNE	3.7	3.8	0
740-759	Congenital Anomalies	168	31.3	31.3	0	40	PCD	6.0	12.0	0
760-779	Certain Causes of Perinatal Morbidity and Mortality	20	3.7	0.2	0	100	PCD	15.7	5.0	0
800-999	Accidents, Poisonings, and Violence	558	104.2	104.2	0	10	PNE	5.1	2.0	0

Columns 4, 5, 6, 8, and 9, represent the responses of the Pediatric Subspecialist.

Source for columns 2, 3, and 7, Inpatient Utilization of Short-Stay Hospitals by Diagnosis, U.S., 1975, Health and Vital Statistics, Series 13, Number 35, DHEW (PHS) 78-1786, April, 1978.

* Initial diagnosis is generally the principal or primary diagnosis.

** No information available from source.

TABLE 27

TOTAL LIVE NEWBORN DISCHARGES BY INITIAL DIAGNOSIS FOR 1976 (a/)

(Pediatric Subspecialist Responses)

1		2	3	4	5	6	7	8	9
ICDA	Number Condition (b/)	Number of Discharges in Thousands, 1976	Discharge Rate per 10,000 Newborns, 1976 (c/)	True Rate per 10,000 Newborns 1978	Percent Rate Change in True Rate 1978 to 1990	Percent that Should be Seen by Subspecialist, 1990	Average Length of Stay in Days, 1976	Number of Visits that Should be made by Subspecialist, 1990	Percent of Visits that Should be Delegated to Nonphysician Provider, 1990
Y20	Single born	2,954	9,768.5	9,768.5	0	2 PHO	3.8	1.0	0
Y21	Single born, immature	165	545.6	545.6	0	2 PHO	14.4	1.0	0
						20 PCD		10.0	0
						10 PNE		1.5	0
Y22	Twin, mate live born	22.8	75.4	75.4	0	2 PHO	6.5	1.0	0
Y23	Twin, mate not live born	0.1	0.3	0.3	0	2 PHO	4	1.0	0
Y24	Twin, immature, mate liveborn	14.7	48.6	48.6	0	2 PHO	14.2	1.0	0
Y26	Multiple born, mates all liveborn	0.2	0.7	0.7	0	2 PHO	1.5	1.0	0
Y28	Multiple born, immature, mates all liveborn	1.0	3.3	3.3	0	2 PHO	4.3	1.0	0
741	Spina bifida	5.0	16.5	16.5	0	100 PNE	9.6	3.0	0
742	Congenital hydrocephalus	3.4	11.2	11.2	0	50 PNE	9.2	1.2	0
778	Other conditions of fetus or newborn (d/)	19.3	63.8	63.8	0	100 PCD	9.1	15.0	0
						3 PNE			

(a/) Includes only infants born in hospital.

(b/) For "y" codes, unless indicated in condition column, there is no mention of immaturity of infant. Excluded from all "y" codes are all premature infants admitted after birth.

(c/) Including all newborns within 1976, according to Bureau of Census, Series II estimates.

(d/) Included are fetal blood loss before birth, postmaturity, hemorrhagic disease of newborn, cold injury syndrome, bleeding from umbilical stump, embryopathia, hydrops and kernicterus (not due to hemolytic disease), cardiac failure, physiological jaundice and meconium plug syndrome.

Columns 2, 3, and 7 represent the source.

Columns 4, 5, 6, 8 and 9 represent the responses.

Source: Hospital Discharge Survey (unpublished data), 1976.

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